

**Mountain Goat
Management Report
of Survey-Inventory Activities
Federal Aid in Wildlife Restoration
1 July 1997–30 June 1999**

**Mary V. Hicks, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation
December 2000**

Please note that population and harvest data in this report are estimates and may be refined at a later date.

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LOCATION

GAME MANAGEMENT UNIT: 7 and 15 (8397 mi²)

GEOGRAPHIC DESCRIPTION: Kenai Peninsula

BACKGROUND

Mountain goats inhabit the entire length of the Kenai Mountains, the westernmost natural extension of the species' continental range. Goat populations are most abundant in the coastal mountains and least abundant along the drier western slopes and interior portions of the Kenai Mountains where they coexist with Dall sheep (*Ovis dalli*).

The Kenai Peninsula has been a popular mountain goat hunting area since statehood because of its proximity to Anchorage and relatively good accessibility. By the late 1970s wildlife managers recognized that long general seasons with bag limits of 2 goats and moderate to severe winters had led to local population declines. Consequently, permit hunts were implemented in 1978 to reduce harvest rates and to distribute hunters. Since 1982, goat harvest on the Kenai Peninsula has been managed by a combination of drawing and registration permit hunts. Holdermann (1989) provided a summary of the Kenai Peninsula mountain goat management system, which was reviewed by Del Frate and Spraker (1994).

Goats within the Kenai Fjords National Park (KFNP) were protected from hunting when the park was established in 1980. KFNP includes some private and state lands that may in the future support additional hunting opportunity. In addition to KFNP, most goat habitat on the Kenai Peninsula is within the Kenai National Wildlife Refuge, Chugach National Forest, or Kachemak Bay State Park and remains virtually unaffected by development (Del Frate and Spraker 1994).

Spruce bark beetles (*Dendroctonus rufipennis*) have infested and killed many older stands of spruce trees on the Kenai Peninsula. Markets for Alaska wood products and the need to reduce fire danger may facilitate extensive logging on federal, state, and private lands and could adversely affect goat populations through loss of winter habitat. Various landowners have planned salvage operations throughout the Kenai Peninsula that may affect mountain goat winter habitat.

Backcountry recreation may be one of the fastest growing winter sports activities that may affect goats in the future. Technological advances in snowmachine design have made it easier for riders to access more and steeper terrain that may be in or near adjacent mountain goat habitat. More snowmachine enthusiasts are accessing and exploring the backcountry with these bigger and better machines. Private and commercial backcountry ski tours are also on the increase. While most skiers restrict their activities to day-trips from the existing highways alternative transportation is provided by the Alaska Railroad and by helicopter tours. One helicopter business has recently established operations on the Kenai Peninsula. Temporary permits were issued for both 1997 and 1998 to transport skiers to remote areas (Chugach National Forest Environmental Assessment 1999). The operator has submitted a 5-year permit application to increase its operation to 11 zones encompassing 368,400 acres of peninsula lands near Girdwood.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

To maintain a population of 4000–4500 mountain goats with a harvest of predominantly (66% minimum) males.

METHODS

The Kenai Peninsula mountain goat range is divided into 35 count areas that correspond to hunt areas. Since the early 1970s ADF&G has routinely monitored goat populations in these areas by midsummer aerial surveys (Lentfer 1955, Nichols 1980). We fly surveys before hunting season in a Piper PA-18 Super Cub or Cessna 305 Birdog with an observer during early morning and evening hours in July and August. Cool temperatures, light wind and a high overcast cloud cover characterize optimum counting conditions. Flights follow drainage contours beginning at the subalpine zone and progressing upward into the alpine zone by 150–200 m increments. We count and classify goats as kids (<4 months) or older goats and record data on standardized forms.

Three goat population trend areas, each consisting of 2 or 3 contiguous count areas, were established in 3 separate geographic regions of the Kenai. The three areas became the primary sampling units for monitoring trends in goat production and abundance for the regions they represent. A description of these trend areas was reported in Del Frate (1992).

The size of the peninsula mountain goat population is first estimated by combining the most recent aerial count of each survey area. Assuming 70% to 90% (Nichols 1980) of goats present during aerial surveys are observed, we estimate population expressed as a range reflecting those sightability variations.

Goat harvest on the Kenai Peninsula is managed through a system of permit hunts. Harvest quotas are set and adjusted, based on the number of goats we observed in each hunt area during the most recent survey. The number of drawing permits issued for each area is limited based on previous success rates and experience and set, attempting to meet but not exceed the quota. At the end of the drawing season, we determine if any areas have unfilled quotas and can be reopened to an unlimited registration permit hunt. The registration permits are valid for a seven-day period. Areas are only opened to registration permit hunting if the remaining portion of the harvest quota is large enough that there is little chance of overharvest. Recently the Board of Game authorized the department to issue archery only registration permits for areas where the quota had not been reached but the threat of overharvest was too great if opened to all weapon types. Emergency orders to close these registration hunts are issued when harvest goals are reached.

Subsistence harvest is allowed in only two hunt areas under the State's subsistence program. We manage these hunts similar to the above general seasons. Tier II subsistence permits were allocated to achieve the harvest goal. If the quota has not been reached then Tier I registration permits (Alaska residents only) are issued.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

We observed 2772 goats during the latest surveys of count areas on the Kenai Peninsula. This excluded the KFNP that contained an estimated 800–1000 goats. We estimated 3880 (90% observability) to 4960 goats (70% observability) inhabit the Kenai Peninsula. Goat populations have declined approximately 10% during this reporting period.

Blying Sound. Aerial surveys of the Blying Sound trend area indicated a stable population of approximately 300 goats between 1968–71. Goat numbers declined during the mid 1970s, steadily increased to at least 458 goats by 1983 (Table 1) then stabilized around 393 goats during the early 1990s. Although no recent surveys have been completed we suspect this region's population has experienced similar declines.

West Slope. The formations along the west slope of the Kenai Mountains from Chickaloon Bay to Tustumena Glacier support the lowest mountain goat density on the Kenai Peninsula because of habitat and climate limitations and possibly competition with Dall sheep. The goat population in this area declined in the mid-1970s but increased through 1992 but then declined and stabilized (Table 1).

Kachemak Bay. The quality of habitat and goat abundance in the upper Kachemak Bay trend area was similar to Blying Sound. The distribution of goats and Dall sheep overlap in the northern one-third of this trend area. We have minimal survey data for this area before 1980; however, the population grew substantially throughout the 1980s and early 1990s (Table 1). Surveys were completed in each of the 3 areas between 1996 and 1998 (Table 2). These areas indicated a substantial decline in Kachemak Bay goats from the population high in 1992. Winter weather is suspected as the primary cause for the decline.

Population Composition

In 1997 we surveyed 11 count areas and tallied 860 goats with 24% kids (Table 2). In 1998 we counted 722 goats in 8 count areas with 20% kids.

MORTALITY

Harvest

Season and Bag Limit. The sport season has remained 10 August to 30 September by drawing permit since 1987 (Table 3). This was followed by a 15 October to 30 November registration permit hunt (Table 4). The Tier II subsistence hunt for hunt areas TG364 and TG365 was from 1 August to 30 September. The bag limit was 1 goat for all areas.

Board of Game Actions and Emergency Orders. The Board of Game increased the maximum number of permits the department could issue to 500 during the fall 1992 meeting. The *up to* language was inadvertently left out of the codified. The proposal was resubmitted and approved during the March 1997 Board of Game meeting. During this meeting the board also approved the

department's plans to allow archery-only hunts during the late fall registration season. Archery hunts only take place in those areas where a harvestable surplus exists and a general all-weapon season is not practical.

A separate proposal to reopen state and private inholdings within the KFNP was approved. However, the principal landowner refused to allow the public access so only state lands were opened in Hunt area DG351.

Registration permit hunts are managed for the remainder of the harvestable quota. When the quotas were reached, emergency orders were issued closing the respective hunt areas. In 1997 Two emergency orders were issued: on October 23 RG333, 345, 346 and 352 were closed, on October 31 RG339, 361, and 365 were closed. In 1998 two emergency orders were issued on October 27 (RG333, 346, and 365) and November 21 (RG334 and 340).

Hunter Harvest. Hunters harvested 134 goats on the Kenai Peninsula in 1997. Drawing permittees killed 79 goats (56 males, 22 females, and 1 unspecified sex) throughout 26 hunt areas (Table 5). Permittees harvested 46 goats (30 males, and 16 females) from 16 hunt areas during the registration permit hunt (Table 6). Subsistence hunters harvested 6 billy and 3 nanny goats in the 2 Tier II subsistence hunts (Table 7).

Hunters harvested 113 goats on the Kenai Peninsula in 1998. Drawing permittees killed 73 goats (51 males, 22 females) throughout 26 hunt areas (Table 8). Permittees harvested 36 goats (23 males, 12 females and one unspecified sex) from 101 hunt areas during the registration permit hunt (Table 9). Subsistence hunters harvested 3 billy and 1 nanny goats in the Tier II hunts (Table 7).

Hunter Residency and Success. Success rates varied between hunt areas and hunt types as well as between years (Tables 10, 11, and 12). Goat distribution, weather, and hunter demographics contributed to these variations. Nonresident hunters composed less than 2% of total hunters in both 1997 and 1998 (Tables 13 & 14). However, nonresidents usually had high success rates because of guiding requirements. The overall success rate of nonresidents was 40% and 60% for 1997 and 1998, respectively. For the years 1992-1998 the average success rate for drawing permit hunters was 37.7%. For registration permit hunters the average success rate was 24.2%. The lower than normal success rate for registration permit hunters (15%) in 1998 was due to poor weather conditions throughout this season.

Harvest Chronology. Drawing permittees harvested a higher proportion of goats during the last part of September in 1997 and the first part of the season in 1998 (Table 15). The registration season was quota-based and hunt areas were closed as quotas were achieved. Consequently, harvest occurred shortly after registration hunting began. Many areas with easy access had high demand and closed within 5–7 days of the start of the registration period.

Transport Methods. Transportation methods varied between game management units because of accessibility. In 1997 successful hunters in Unit 7 used highway vehicles (47%), boats (36%), and aircraft (11%) (Table 16). In Unit 15 successful hunters used aircraft (59%), boats (36%), and horses (2%) (Table 17). All other transportation methods were less than 2%.

In 1998 the transportation types used were similar to the previous year. Successful hunters in Unit 7 used highway vehicles (38%), boats (38%), aircraft (18%), and 4-wheeler (3%) (Table 16). In Unit 15 successful hunters used aircraft (52%) boats (45%) and horse (3%) (Table 17).

HABITAT

Spruce bark beetles have infested much of the Kenai Peninsula. The infestation affects primarily white spruce (*Picea glauca*) and Lutz spruce (*Picea x lutzii*) trees greater than 5" in diameter. In response several agencies and landowners have begun salvage logging throughout the Kenai (Steve Albert ADF&G Habitat Division, pers. commun.). Several parcels of land are scheduled for logging that may include mountain goat winter habitat. ADF&G estimated that over 8500 acres of potential winter habitat were logged in 1996. More importantly, over 2500 acres have been scheduled for harvest in the 2 state subsistence hunt areas. (TG364 and TG365) in Unit 15C.

CONCLUSIONS AND RECOMMENDATIONS

We observed 2772 goats on the Kenai Peninsula, excluding KFNP. An estimated 800 to 1000 goats inhabited the KFNP. Excluding KFNP, we estimated between 3080 (assuming 90% observability) and (assuming 70% observability) 3960 goats inhabited the Kenai Peninsula. Even though the goat population has declined we met our management objective of maintaining 4000 to 4500 mountain goats on the Kenai Peninsula.

The system of mountain goat harvest management developed on the Kenai Peninsula may have application in other areas of the state. A comprehensive evaluation was reported at the Northern Wild Sheep and Goat Symposium in 1994 (Del Frate and Spraker 1994). We provided additional hunter opportunity with the addition of archery-only hunts in areas that would otherwise be closed during the registration season. We do not recommend any changes in goat harvest management on the Kenai Peninsula at this time.

Winter recreation continues to gain popularity on the Kenai Peninsula. It is unclear how these backcountry users affect goat distribution or behavior. We recommend that ADF&G coordinate with federal land managers and address this issue.

Winter severity and access to winter habitat may limit mountain goat populations on the Kenai (Hjeljord 1973, Del Frate and Spraker 1994). Surveys following poor weather conditions (deep, persistent snow with warm periods causing the snow to crust) during 1992–93 support this hypothesis. Aerial counts revealed declines in many of the areas within the west slope trend area and south into Kachemak bay. Because hunter harvest is the primary mortality factor in prime-aged mountain goats (Smith 1986), we must be cautious to recognize declines and adjust harvest objectives to avoid larger declines.

Forestry practices on state and private land adjacent to winter mountain goat habitat could be detrimental to mountain goats. Removal of the overstory reduces the amount of thermal cover and forage availability on winter habitat. The department should delineate all winter habitat and work closely with landowners to ensure this habitat is protected.

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Table 1 Kenai Peninsula mountain goat trends 1968-99

Trend Area	Year	Kids: 100 older Goats	% Kids	Total Count	Population Trend ^a
Blying Sound (Count areas G345,G346)	1968	34.1	25.4	299	
	1971	23.6	19.1	308	+3
	1974	38.0	27.5	258	-16
	1977	21.1	17.4	333	+29
	1978	39.2	28.1	366	+10
	1983	33.9	25.3	458	+25
	1985	20.3	16.9	397	-13
	1987	25.6	20.4	461	+16
	1991	24.2	19.5	385	-16
	1994	20.6	17.1	393	+2
West Slope (Count areas G355,G356,G357)	1968	44.0	30.6	36	
	1977	25.0	20.0	25	-31
	1978	31.6	24.0	25	+0
	1979	40.6	28.9	45	+80
	1980	27.1	21.3	61	+36
	1981	34.6	25.7	70	+15
	1983	43.2	30.2	106	+51
	1987	44.1	30.6	160	+51
	1990	37.5	27.3	110	-31
	1991	33.3	25.0	128	+16
	1992	32.2	24.4	156	+22
	1993	32.0	24.2	128	-18
	1997	36.6	26.8	127	-01
Kachemak Bay (Count areas G358,G359,G360)	1968	42.4	29.8	289	
	1978	32.9	24.8	105	-64
	1980	29.3	22.7	172	+64
	1987	27.5	21.6	301	+75
	1990	32.7	24.6	463	+54
	1992	31.4	23.9	544	+17

^aPopulation trend expressed as % change between successive surveys.

Table 2 Units 7 & 15 aerial mountain goat composition counts and estimated population size, 1994–98

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG331	1994/95 ^a	--	--	--	--	--	--	--
	1995/96	42	14	--	33	56	--	56
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99	41	8	--	20	49	--	49
DG332	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97	17	7	--	41	24	--	24
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99	57	16	--	28	73	--	73
DG333	1994/95	89	23	--	26	112	--	112
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98	135	41	--	30	176	--	176
	1998/99 ^a	--	--	--	--	--	--	--
DG334	1994/95	67	24	--	36	91	--	91
	1995/96	--	--	--	--	--	--	114 ^f
	1996/97	--	--	--	--	--	--	--
	1997/98	83	24	--	29	107	--	107
	1998/99 ^a	--	--	--	--	--	--	--
DG335	1994/95	63	19	--	30	82	--	82
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^b	27	5	--	19	32	--	32
	1998/99 ^a	--	--	--	--	--	--	--

Table 2 Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG336	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97	132	46	--	35	178	--	178
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG337	1994/95	12	1	--	8	13	--	13
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97	16	3	--	19	19	--	19
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG338	1994/95 ^a	--	--	--	--	--	--	--
	1995/96	14	2	--	14	16	--	16
	1996/97	7	1	--	14	8	--	8
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG339	1994/95 ^a	--	--	--	--	--	--	--
	1995/96	106	23	--	22	129	--	129
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG340	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97	64	21	--	33	85	--	85
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--

Table 2 Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG341	1994/95 ^a	--	--	--	--	--	--	--
	1995/96	39	14	--	36	53	--	53
	1996/97	36	17	--	47	53	--	53
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG342	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^b	57	20	--	35	77	--	77
	1998/99 ^a	--	--	--	--	--	--	--
DG343	1994/95 ^a	--	--	--	--	--	--	--
	1995/96	58	16	--	28	74	--	74
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG344	1994/95	53	13	0	25	66	--	66
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG345	1994/95	146	25	0	17	171	--	171
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--

Table 2 Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG346	1994/95	180	42	0	23	222	--	222
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97	166	52	--	31	218	--	218
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG347	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG348	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG349	1994/95 ^a	--	--	--	--	--	--	31
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG350	1994/95 ^a	--	--	--	--	--	--	222
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--

Table 2 Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG351	1994/95 ^a	--	--	--	--	--	--	335
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^c	17	10	--	59	27	--	27
	1998/99 ^a	--	--	--	--	--	--	--
DG352	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99	137	32	--	23	169	--	169
DG353	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97	0	0	--	--	0	--	0
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG354	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97	35	8	--	23	43	--	43
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG355	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98	21	6	--	29	27	--	27
	1998/99 ^a	--	--	--	--	--	--	--

Table 2 Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG356	1994/95	34	4	0	12	38	--	38
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98	35	17	--	49	52	--	52
	1998/99	27	9	--	33	36	--	36
DG357	1994/95 ^a	--	--	--	--	--	--	--
	1995/96	39	12	--	30	51	--	51
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98	37	11	--	30	48	--	48
	1998/99 ^a	--	--	--	--	--	--	--
DG358	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97	40	16	--	40	56	--	56
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99 ^a	--	--	--	--	--	--	--
DG359	1994/95	75	17	0	23	92	--	92
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99	39	7	--	18	46	--	46
DG360	1994/95	138	31	0	22	169	--	169
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^c	35	14	--	40	49	--	49
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99	96	26	--	27	122	--	122

Table 2 Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG361	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98	48	13	--	27	61	--	61
	1998/99 ^a	--	--	--	--	--	--	--
DG362	1994/95 ^a	--	--	--	--	--	--	--
	1995/96	110	45	--	41	155	--	155
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99	88	20	--	23	108	--	108
DG363	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98	150	51	--	34	201	--	201
	1998/99 ^a	--	--	--	--	--	--	--
DG364	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98	45	7	--	16	52	--	52
	1998/99 ^a	--	--	--	--	--	--	--
DG365	1994/95 ^a	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--
	1997/98 ^a	--	--	--	--	--	--	--
	1998/99	93	26	--	28	119	--	119

^aNo survey.^bPoor count.^cPartial count.

Table 3 Summary of mountain goat drawing permit season harvest for the Kenai Peninsula, 1984-98

Year	Season Dates	Nr. Permits Issued	Nr. Hunters	Percent Success	Harvest			Total
					M	F	U	
1984	10 Aug. - 30 Sept.	355	169	38	50	14	1	65
1985	10 Aug. - 30 Sept.	16	11	45	2	3		5
1986	6 Sept. - 31 Oct.	130	60	58	21	14		35
1987	10 Aug. - 30 Sept.	340	160	42	49	17	1	67
1988	10 Aug. - 30 Sept.	329	156	38	43	17		60
1989	10 Aug. - 30 Sept.	324	146	47	46	22		68
1990	10 Aug. - 30 Sept.	280	151	36	36	18	1	55
1991	10 Aug. - 30 Sept.	320	172	36	44	17	1	62
1992	10 Aug. - 30 Sept.	347	180	43	54	23	1	78
1993	10 Aug. - 30 Sept.	420	215	47	58	42		100
1994	10 Aug. - 30 Sept.	395	216	31	44	24		68
1995	10 Aug. - 30 Sept.	381	192	39	46	27	1	74
1996	10 Aug. - 30 Sept.	444	252	36	58	32		90
1997	10 Aug. - 30 Sept.	385	208	38	56	22	1	79
1998	10 Aug. - 30 Sept.	444	236	31	51	22		73
Total					658	314	7	979

Table 4 Summary of mountain goat registration permit season harvest for the Kenai Peninsula, 1984-98

Year	Season Dates	Permits Issued	Nr. Hunters	Percent Success	Harvest			Total
					M	F	U	
1984	15 Oct. - 30 Nov.	289	189	37	43	26	1	70
1985	1 Oct. - 31 Oct.	578	326	38	64	57	3	124
1986	6 Sept. - 31 Oct.	349	180	44	52	27	1	80
1987	15 Oct. - 30 Nov.	327	155	25	26	13		39
1988	15 Oct. - 30 Nov.	301	180	39	46	24	1	71
1989	15 Oct. - 30 Nov.	Unk.	127	25	18	13	1	32
1990	15 Oct. - 30 Nov.	255	125	29	23	12	3	38 ^a
1991	15 Oct. - 30 Nov.	416	212	28	42	17		59
1992	15 Oct. - 30 Nov.	433	263	29	52	22	1	75
1993	15 Oct. - 30 Nov.	481	281	25	45	25		70
1994	15 Oct. - 30 Nov.	438	245	22	41	11	1	53
1995	15 Oct. - 30 Nov.	427	231	28	39	24	1	64
1996	15 Oct. - 30 Nov.	353	139	29	24	16	1	41
1997	15 Oct. - 30 Nov.	321	192	24	30	16	0	46
1998	15 Oct. - 30 Nov.	433	244	15	23	12	1	36
Total					568	315	15	898

^aIncludes 2 goats illegally taken during the registration hunt.

Table 5 Kenai Peninsula mountain goat drawing permit hunt summary, 1997^a

Hunt area	Permits issued	Nr. of hunters	Percent success	Harvest			Total
				Male	Female	Unknown	
DG331	3	3	67	1	1		2
DG333	20	11	9	1	0		1
DG334	8	6	100	4	2		6
DG335	10	8	50	2	2		4
DG336 ^b	25	16	19	2	1		3
DG339	15	15	33	4	1		5
DG340 ^c	25	11	9	1	0		1
DG341	6	6	83	1	4		5
DG342	14	11	36	2	2		4
DG343	8	7	71	4	1		5
DG344	16	7	29	2	0		2
DG345 ^b	42	20	25	4	1		5
DG346 ^c	42	22	27	6	0		6
DG347	20	12	58	3	4		7
DG351	8	0	0	0	0		0
DG352 ^b	25	11	36	1	3		4
DG354 ^b	10	4	50	2	0		2
DG355	4	1	0	0	0		0
DG356	5	1	100	1	0		1
DG357	10	5	0	0	0		0
DG358 ^c	12	5	100	4	1		5
DG359	20	9	67	4	2		6
DG360	30	11	27	3	0		3
DG361	20	7	14	1	0		1
DG362	20	10	40	4	0		4
DG363	30	11	45	2	2	1	5
Totals	385	208	38	56	22	1	79

^aSeason Dates: 10 August - 30 September.^bOne permit report was not returned.^cTwo permit reports were not returned.

Table 6 Kenai Peninsula mountain goat registration permit hunt summary, 1997^a

Hunt area	Permits issued	Nr. of hunters	Percent success	Harvest			Total
				Male	Female	Unknown	
RG333 ^b	67	48	13%	4	2		6
RG336	40	14	7%	1	0		1
RG339 ^c	23	14	14%	0	2		2
RG340	11	5	60%	3	0		3
RG344 ^d	1	1	100%	0	1		1
RG345 ^b	7	6	67%	3	1		4
RG346 ^b	58	35	31%	8	3		11
RG352 ^b	8	5	60%	1	2		3
RG355	2	2	0%	0	0		0
RG356	1	1	0%	0	0		0
RG357 ^c	1	0	0%	0	0		0
RG360 ^c	22	10	10%	1	0		1
RG361 ^c	7	4	50%	1	1		2
RG362	35	20	5%	0	1		1
RG363	24	16	19%	3	0		3
RG365 ^{ce}	14	11	73%	5	3		8
Totals	321	192	24%	30	16	0	46

^aSeason Dates: 15 October - 30 November.

^bHunt areas RG333, RG345, RG346 and RG352 closed by emergency order October 23, 1997.

^cHunt areas RG339, RG361 and RG365 closed by emergency order October 31, 1997.

^dPermit for hunt RG344 issued by mistake in Anchorage. Hunt was not open.

^eLimited to residents of Alaska.

Table 7 Kenai Peninsula subsistence harvest, 1986-98

Year	Season Dates	Nr. Permits Issued	Nr. Hunters	Percent Success	Harvest			
					M	F	U	Total
1986	6 Sep-31 Oct	15	6	50	1	2		3
1987	10 Aug-31 Oct	7	5	40	1	1		2
1988	10 Aug-31 Oct	7	3	0	0	0		0
1989 ^a	1 Aug-31 Oct				0	0	3	3
1990 ^b	28 Sep-18 Dec				1	4		5
1991 ^c	1 Aug-30 Sep	94	42	31	13	0		13
1992 ^c	1 Aug-30 Sep	94	53	45	19	5		24
1993	1 Aug-30 Sep	50	27	22	5	1		6
1994	1 Aug-30 Sep	105	66	41	21	6		27
1995	1 Aug-30 Sep	50	23	30	4	3		7
1996	1 Aug-30 Sep	46	21	29	6	0		6
1997	1 Aug-30 Sep	46	31	29	6	3		9
1998	1 Aug-30 Sep	46	20	20	3	1		4
Total					80	26	3	113

^aSubsistence hunts 852W, 863W, 864W, and 865W. Effort was unavailable.

^bTier II Subsistence hunts 865T and 875T. Effort was unavailable.

^cTier II Subsistence hunts 852T and 863T-865T.

Table 8 Kenai Peninsula mountain goat drawing permit hunt summary, 1998^a

Hunt area	Permits issued	No. of hunters	Percent success	Harvest			Total
				Male	Female	Unknown	
DG331	3	3	100%	2	1		3
DG333	25	19	32%	4	2		6
DG334	6	4	25%	1	0		1
DG335	10	7	29%	1	1		2
DG336 ^b	30	16	31%	4	1		5
DG339	15	13	15%	2	0		2
DG340 ^b	30	13	15%	1	1		2
DG341 ^b	4	2	50%	0	1		1
DG342	12	9	11%	0	1		1
DG343	6	5	40%	2	0		2
DG344	16	13	38%	3	2		5
DG345 ^b	40	12	33%	3	1		4
DG346 ^c	40	17	24%	3	1		4
DG347	20	15	33%	5	0		5
DG351	4	3	33%	1	0		1
DG352	25	13	54%	2	5		7
DG354	10	3	0%	0	0		0
DG355	4	4	25%	0	1		1
DG356	6	5	0%	0	0		0
DG357	10	6	33%	2	0		2
DG358	10	2	50%	1	0		1
DG359	16	9	0%	0	0		0
DG360 ^b	30	12	33%	2	2		4
DG361	20	6	17%	1	0		1
DG362 ^b	22	9	44%	4	0		4
DG363 ^b	30	16	56%	7	2		9
Totals	444	236	31%	51	22	0	73

^aSeason Dates: 10 August - 30 September.^bOne hunter did not return a report.^cTwo hunters did not return a report.

Table 9 Kenai Peninsula mountain goat registration permit hunt summary, 1998^a

Hunt area	Permits issued	Nr. of hunters	Percent success	Harvest			Total
				Male	Female	Unknown	
RG333 ^b	81	51	6	3	0		3
RG334 ^c	80	54	9	3	2		5
RG336	79	35	6	2	0		2
RG339	30	18	0	0	0		0
RG340 ^c	3	2	100	2	0		2
RG345	25	7	29	1	1		2
RG346 ^b	89	54	24	7	5	1	13
RG354	6	3	33	1	0		1
RG361	22	11	9	1	0		1
RG365 ^{b,d}	18	9	78	3	4		7
Totals	433	244	15	23	12	1	36

^a Season Dates: 15 October - 30 November.

^b Hunt areas RG333, RG346 and RG365 closed by emergency order October 27, 1998.

^c Hunt areas RG334 and RG340 closed by emergency order November 21, 1998.

^d Limited to residents of Alaska. Only a portion of the hunt area was opened.

Table 10 Units 7 & 15 mountain goat harvest data by drawing permit hunt, 1994-98

Hunt Nr. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG331	1994/95	2	50	100	0	0	0	--	--	0
	1995/96	3	33	50	50	0	1	--	--	1
	1996/97	3	0	50	50	2	0	--	--	2
	1997/98	3	0	33	67	1	1	--	--	2
	1998/99	3	0	0	100	2	1	--	--	3
DG332	1994/95	0	--	--	--	--	--	--	--	--
	1995/96	0	--	--	--	--	--	--	--	--
	1996/97	0	--	--	--	--	--	--	--	--
	1997/98	0	--	--	--	--	--	--	--	--
	1998/99	0	--	--	--	--	--	--	--	--
DG333	1994/95	15	47	87	13	0	1	--	--	1
	1995/96	15	27	73	27	3	0	--	--	3
	1996/97	15	33	90	10	0	1	--	--	1
	1997/98	20	45	91	9	1	0	--	--	1
	1998/99	25	24	68	32	4	2	--	--	6
DG334	1994/95	10	10	67	33	3	0	--	--	3
	1995/96	10	20	25	75	2	4	--	--	6
	1996/97	8	13	29	71	4	1	--	--	5
	1997/98	8	25	0	100	4	2	--	--	6
	1998/99	6	33	75	25	1	0	--	--	1
DG335	1994/95	12	33	50	50	4	0	--	--	4
	1995/96	12	33	13	87	5	2	--	--	7
	1996/97	8	38	80	20	0	1	--	--	1
	1997/98	10	20	50	50	2	2	--	--	4
	1998/99	10	30	71	29	1	1	--	--	2

Table 10 Continued

Hunt Nr. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG336	1994/95	25	64	89	11	1	0	--	--	1
	1995/96	25	56	90	10	1	0	--	--	1
	1996/97	25	36	80	20	1	2	--	--	3
	1997/98	25	36	81	19	2	1	--	--	3
	1998/99	30	47	69	31	4	1	--	--	5
DG337	1994/95	2	50	100	0	0	0	--	--	0
	1995/96	--	--	--	--	--	--	--	--	--
	1996/97	--	--	--	--	--	--	--	--	--
	1997/98	--	--	--	--	--	--	--	--	--
	1998/99	--	--	--	--	--	--	--	--	--
DG338	1994/95	2	50	100	0	0	0	--	--	0
	1995/96	2	50	0	100	0	1	--	--	1
	1996/97	--	--	--	--	--	--	--	--	--
	1997/98	--	--	--	--	--	--	--	--	--
	1998/99	--	--	--	--	--	--	--	--	--
DG339	1994/95	10	30	57	43	2	1	--	--	3
	1995/96	15	13	40	60	6	1	--	--	7
	1996/97	18	22	50	50	4	3	--	--	7
	1997/98	15	0	67	33	4	1	--	--	5
	1998/99	15	13	85	15	2	0	--	--	2
DG340	1994/95	20	50	80	20	1	1	--	--	2
	1995/96	20	70	100	0	0	0	--	--	0
	1996/97	25	52	100	0	0	0	--	--	0
	1997/98	25	56	91	9	1	0	--	--	1
	1998/99	30	57	85	15	1	1	--	--	2

Table 10 Continued

Hunt Nr. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG341	1994/95	4	25	67	33	0	1	--	--	1
	1995/96	4	50	0	100	1	1	--	--	2
	1996/97	6	0	33	66	1	1	--	--	2
	1997/98	6	0	17	83	1	4	--	--	5
	1998/99	4	50	50	50	0	1	--	--	1
DG342	1994/95	14	29	50	50	2	3	--	--	5
	1995/96	14	36	44	56	4	1	--	--	5
	1996/97	14	21	73	27	3	0	--	--	3
	1997/98	14	21	64	36	2	2	--	--	4
	1998/99	12	25	89	11	0	1	--	--	1
DG343	1994/95	10	10	44	56	4	1	--	--	5
	1995/96	10	20	50	50	2	2	--	--	4
	1996/97	8	13	71	29	1	1	--	--	2
	1997/98	8	12	29	71	4	1	--	--	5
	1998/99	6	17	60	40	2	0	--	--	2
DG344	1994/95	20	60	100	0	0	0	--	--	0
	1995/96	16	56	86	14	0	1	--	--	1
	1996/97	16	56	57	43	2	1	--	--	3
	1997/98	16	56	71	29	2	0	--	--	2
	1998/99	16	19	62	38	3	2	--	--	5
DG345	1994/95	40	68	69	31	1	3	--	--	4
	1995/96	35	63	50	50	2	3	1	--	6
	1996/97	35	51	71	29	4	1	--	--	5
	1997/98	42	52	75	25	4	1	--	--	5
	1998/99	40	70	67	33	3	1	--	--	4

Table 10 Continued

Hunt Nr. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG346	1994/95	36	33	62	38	8	1	--	--	9
	1995/96	35	26	77	23	6	0	--	--	6
	1996/97	35	57	79	21	2	1	--	--	3
	1997/98	42	48	73	27	6	0	--	--	6
	1998/99	40	58	76	24	3	1	--	--	4
DG347	1994/95	15	27	55	45	3	2	--	--	5
	1995/96	20	60	63	37	2	1	--	--	3
	1996/97	20	30	54	46	2	4	--	--	6
	1997/98	20	40	42	58	3	4	--	--	7
	1998/99	20	25	67	33	5	0	--	--	5
DG351	1994/95	--	--	--	--	--	--	--	--	--
	1995/96	--	--	--	--	--	--	--	--	--
	1996/97	--	--	--	--	--	--	--	--	--
	1997/98	8	100	0	0	0	0	--	--	0
	1998/99	4	25	67	33	1	0	--	--	1
DG352	1994/95 ^a	--	--	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--	--	--
	1996/97	25	40	60	40	5	1	--	--	6
	1997/98	25	56	64	36	1	3	--	--	4
	1998/99	25	48	46	54	2	5	--	--	7
DG354	1994/95	20	55	78	22	2	0	--	--	2
	1995/96	20	60	88	12	1	0	--	--	1
	1996/97	20	50	78	22	2	0	--	--	2
	1997/98	10	60	50	50	2	0	--	--	2
	1998/99	10	70	100	0	0	0	--	--	0

Table 10 Continued

Hunt Nr. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG355	1994/95	4	75	100	0	0	0	--	--	0
	1995/96	4	25	66	33	0	1	--	--	1
	1996/97	4	75	0	100	1	0	--	--	1
	1997/98	4	75	100	0	0	0	--	--	0
	1998/99	4	0	75	25	0	1	--	--	1
DG356	1992/93	6	17	40	60	0	3	--	--	3
	1993/94	8	25	50	50	2	1	--	--	3
	1994/95	8	25	67	33	0	2	--	--	2
	1997/98	5	80	0	100	1	0	--	--	1
	1998/99	6	17	100	0	0	0	--	--	0
DG357	1994/95	12	33	62	38	1	2	--	--	3
	1995/96	10	50	80	20	1	0	--	--	1
	1996/97	10	50	50	50	2	0	--	--	2
	1997/98	10	50	100	0	0	0	--	--	0
	1998/99	10	40	67	33	2	0	--	--	2
DG358	1994/95	20	35	62	38	1	4	--	--	5
	1995/96	20	70	100	0	0	0	--	--	0
	1996/97	25	52	45	55	2	4	--	--	6
	1997/98	12	58	0	100	4	1	--	--	5
	1998/99	10	80	50	50	1	0	--	--	1
DG359	1994/95	28	61	82	18	1	1	--	--	2
	1995/96	20	35	77	23	2	1	--	--	3
	1996/97	20	30	64	36	4	1	--	--	5
	1997/98	20	55	33	67	4	2	--	--	6
	1998/99	16	44	100	0	0	0	--	--	0

Table 10 Continued

Hunt Nr. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG360	1994/95	30	47	69	31	5	0	--	--	5
	1995/96	30	63	45	55	3	3	--	--	6
	1996/97	30	43	59	41	4	3	--	--	7
	1997/98	30	63	73	27	3	0	--	--	3
	1998/99	30	60	67	33	2	2	--	--	4
DG361	1994/95	20	45	82	18	2	0	--	--	2
	1995/96	20	70	50	50	2	1	--	--	3
	1996/97	20	45	60	40	2	2	--	--	4
	1997/98	20	65	86	14	1	0	--	--	1
	1998/99	20	70	83	17	1	0	--	--	1
DG362	1994/95	16	44	56	44	3	1	--	--	4
	1995/96	16	44	44	56	3	2	--	--	5
	1996/97	18	72	100	0	0	0	--	--	0
	1997/98	20	50	60	40	4	0	--	--	4
	1998/99	22	50	66	44	4	0	--	--	4
DG363	1994/95 ^a	0	--	--	--	--	--	--	--	--
	1995/96 ^a	0	--	--	--	--	--	--	--	--
	1996/97	30	57	15	85	9	2	--	--	11
	1997/98	30	63	55	45	2	2	1	--	5
	1998/99	30	47	44	56	7	2	--	--	9

^a Subsistence season.

Table 11 Units 7 & 15 mountain goat harvest data by registration permit hunt, 1994-98

Hunt Nr. /Area	Regulatory year	Permits issued	Percent Did not hunt	Percent Unsuccessful hunters	Percent Successful hunters	Males	Females	Unk.	Illegal	Total harvest
RG333	1994/95	95	49	96	4	2	0	--	--	2
	1995/96	101	60	93	7	2	1	--	--	3
	1996/97	58	76	86	14	2	0	--	--	2
	1997/98	67	28	87	13	4	2	--	--	6
	1998/99	81	37	94	6	3	0	--	--	3
RG334	1994/95 ^a	0	--	--	--	--	--	--	--	0
	1995/96 ^a	0	--	--	--	--	--	--	--	0
	1996/97 ^a	0	--	--	--	--	--	--	--	0
	1997/98 ^a	0	--	--	--	--	--	--	--	0
	1998/99 ^b	80	33	91	9	3	2	--	--	5
RG335	1994/95 ^a	0	--	--	--	--	--	--	--	0
	1995/96 ^a	0	--	--	--	--	--	--	--	0
	1996/97	52	62	90	10	1	1	--	--	2
	1997/98 ^a	0	--	--	--	--	--	--	--	0
	1998/99 ^a	0	--	--	--	--	--	--	--	0
RG336	1994/95	63	46	91	9	3	0	--	--	3
	1995/96	74	45	85	15	5	1	--	--	6
	1996/97	37	70	100	0	0	0	--	--	0
	1997/98	40	65	93	7	1	0	--	--	1
	1998/99	79	56	94	6	2	0	--	--	2
RG339	1994/95 ^a	0	--	--	--	--	--	--	--	0
	1995/96 ^a	0	--	--	--	--	--	--	--	0
	1996/97 ^a	0	--	--	--	--	--	--	--	0
	1997/98 ^b	23	39	86	14	0	2	--	--	2
	1998/99 ^b	30	40	100	0	0	0	--	--	0

Table 11 Continued

Hunt Nr. /Area	Regulatory year	Permits issued	Percent Did not hunt	Percent Unsuccessful hunters	Percent Successful hunters	Males	Females	Unk.	Illegal	Total harvest
RG340	1994/95 ^c	0	--	--	--	--	--	--	--	0
	1995/96	9	78	50	50	0	1	--	--	1
	1996/97	8	88	100	0	0	0	--	--	0
	1997/98	11	55	40	60	3	0	--	--	3
	1998/99	3	33	0	100	2	0	--	--	2
RG344	1994/95	50	42	90	10	3	0	--	--	3
	1995/96 ^a	0	--	--	--	--	--	--	--	0
	1996/97 ^a	0	--	--	--	--	--	--	--	0
	1997/98 ^d	1	0	0	100	0	1	--	--	1
	1998/99 ^a	0	--	--	--	--	--	--	--	0
RG345	1994/95	13	39	50	5	3	0	1	--	4
	1995/96 ^a	0	--	--	--	--	--	--	--	0
	1996/97	19	53	56	44	2	1	1	--	4
	1997/98	7	14	33	67	3	1	--	--	4
	1998/99	25	72	71	29	1	1	--	--	2
RG346	1994/95	68	49	66	34	9	3	--	--	12
	1995/96	86	50	70	30	7	5	--	--	12
	1996/97	88	60	66	34	8	4	--	--	12
	1997/98	58	40	69	31	8	3	--	--	11
	1998/99	89	39	76	24	7	5	1	--	13
RG347	1994/95	30	43	76	24	1	3	--	--	4
	1995/96	40	28	72	28	4	3	1	--	8
	1996/97 ^a	0	--	--	--	--	--	--	--	0
	1997/98 ^a	0	--	--	--	--	--	--	--	0
	1998/99 ^a	0	--	--	--	--	--	--	--	0

Table 11 Continued

Hunt Nr. /Area	Regulatory year	Permits issued	Percent Did not hunt	Percent Unsuccessful hunters	Percent Successful hunters	Males	Females	Unk.	Illegal	Total harvest
RG352	1994/95	7	0	14	86	6	0	--	--	6
	1995/96	15	27	36	64	4	3	--	--	7
	1996/97	7	57	66	33	1	0	--	--	1
	1997/98	8	38	40	60	1	2	--	--	3
	1998/99 ^a	0	--	--	--	--	--	--	--	0
RG354	1994/95	25	40	93	7	1	0	--	--	1
	1995/96	38	45	81	19	2	2	--	--	4
	1996/97 ^a	--	--	--	--	--	--	--	--	--
	1997/98 ^a	0	--	--	--	--	--	--	--	0
	1998/99	6	50	67	33	1	0	--	--	1
RG355	1994/95 ^a	0	--	--	--	--	--	--	--	0
	1995/96 ^a	0	--	--	--	--	--	--	--	0
	1996/97 ^a	0	--	--	--	--	--	--	--	0
	1997/98 ^c	2	0	100	0	0	0	--	--	0
	1998/99 ^a	0	--	--	--	--	--	--	--	0
RG356	1994/95 ^a	0	--	--	--	--	--	--	--	0
	1995/96 ^a	0	--	--	--	--	--	--	--	0
	1996/97 ^a	0	--	--	--	--	--	--	--	0
	1997/98 ^c	1	0	100	0	0	0	--	--	0
	1998/99 ^a	0	--	--	--	--	--	--	--	0
RG357	1994/95 ^a	0	--	--	--	--	--	--	--	0
	1995/96 ^a	0	--	--	--	--	--	--	--	0
	1996/97 ^a	0	--	--	--	--	--	--	--	0
	1997/98 ^c	1	100	0	0	0	0	--	--	0
	1998/99 ^a	0	--	--	--	--	--	--	--	0

Table 11 Continued

Hunt Nr. /Area	Regulatory year	Permits issued	Percent Did not hunt	Percent Unsuccessful hunters	Percent Successful hunters	Males	Females	Unk.	Illegal	Total harvest
RG358	1994/95 ^a	0	--	--	--	--	--	--	--	0
	1995/96	16	50	13	87	5	2	--	--	7
	1996/97 ^a	0	--	--	--	--	--	--	--	0
	1997/98 ^a	0	--	--	--	--	--	--	--	0
	1998/99 ^a	0	--	--	--	--	--	--	--	0
RG359	1994/95	16	25	75	25	3	0	--	--	3
	1995/96 ^a	--	--	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--	--	--
	1997/98 ^a	0	--	--	--	--	--	--	--	0
	1998/99 ^a	0	--	--	--	--	--	--	--	0
RG360	1994/95	22	45	50	50	2	4	--	--	6
	1995/96 ^a	--	--	--	--	--	--	--	--	--
	1996/97 ^a	--	--	--	--	--	--	--	--	--
	1997/98	22	55	90	10	1	0	--	--	1
	1998/99 ^a	0	--	--	--	--	--	--	--	0
RG361	1994/95	8	50	50	50	2	0	--	--	2
	1995/96 ^a	--	--	--	--	--	--	--	--	--
	1996/97	13	46	71	29	2	0	--	--	2
	1997/98	7	43	50	50	1	1	--	--	2
	1998/99	22	50	91	9	1	0	--	--	1
RG362	1994/95 ^a	--	--	--	--	--	--	--	--	--
	1995/96 ^a	--	--	--	--	--	--	--	--	--
	1996/97	25	52	50	50	2	4	--	--	6
	1997/98	35	43	95	5	0	1	--	--	1
	1998/99 ^a	0	--	--	--	--	--	--	--	0

Table 11 Continued

Hunt Nr. /Area	Regulatory year	Permits issued	Percent Did not hunt	Percent Unsuccessful hunters	Percent Successful hunters	Males	Females	Unk.	Illegal	Total harvest
RG363	1994/95	19	42	55	45	4	1	--	--	5
	1995/96	38	21	57	43	9	4	--	--	13
	1996/97	30	47	69	31	2	3	--	--	5
	1997/98	24	33	81	19	3	0	--	--	3
	1998/99 ^a	0	--	--	--	--	--	--	--	0
RG364	1994/95	22	41	85	15	2	0	--	--	2
	1995/96	20	50	80	20	2	0	--	--	2
	1996/97 ^a	0	--	--	--	--	--	--	--	--
	1997/98 ^a	0	--	--	--	--	--	--	--	0
	1998/99 ^a	0	--	--	--	--	--	--	--	0
RG365	1994/95 ^a	0	--	--	--	--	--	--	--	0
	1995/96 ^a	0	--	--	--	--	--	--	--	--
	1996/97	16	31	30	70	4	3	--	--	7
	1997/98	14	21	27	73	5	3	--	--	8
	1998/99	18	50	22	78	3	4	--	--	7

^a No hunt held^b Hunt held but no permits issued^c Archery only registration hunt^d Permit issued by mistake for this hunt.

Table 12 Units 7 & 15 mountain goat harvest data by Tier II subsistence permit hunt, 1994-98

Hunt Nr. /Area	Regulatory year	Permit issued	Did not hunt(%)	Unsuccessful hunters (%)	Successful hunters (%)	Males	Females	Unk.	Illegal	Total harvest
TG352	1994/95	25	68	62	38	2	1	--	--	3
	1995/96 ^b	0	--	--	--	--	--	--	--	0
	1996/97 ^{ab}	0	--	--	--	--	--	--	--	0
	1997/98 ^a	0	--	--	--	--	--	--	--	0
	1998/99 ^a	0	--	--	--	--	--	--	--	0
TG363	1994/95	30	27	59	41	7	2	--	--	9
	1995/96 ^b	0	--	--	--	--	--	--	--	0
	1996/97 ^{ab}	0	--	--	--	--	--	--	--	0
	1997/98 ^a	0	--	--	--	--	--	--	--	0
	1998/99 ^a	0	--	--	--	--	--	--	--	0
TG364	1994/95	20	30	79	21	3	0	--	--	3
	1995/96	20	50	80	20	2	0	--	--	2
	1996/97	16	25	70	30	3	0	--	--	3
	1997/98	16	25	75	25	2	1	--	--	3
	1998/99	16	56	71	29	1	1	--	--	2
TG365	1994/95	30	27	45	55	9	3	--	--	12
	1995/96	30	57	61	39	2	3	--	--	5
	1996/97	30	70	67	33	3	0	--	--	3
	1997/98	30	37	68	32	4	2	--	--	6
	1998/99	30	57	85	15	2	0	--	--	2

^a Drawing hunt only.^b No subsistence hunt held. Hunt area was located in non-subsistence area created by the Board of Game.

Table 13 Units 7 & 15 mountain goat hunter drawing permit hunt residency and success, 1992-98

Regulatory year	Successful				Unsuccessful				Total hunters
	resident	Nonresident	Unspec.	Total (%)	resident	Nonresident	Unspec.	Total (%)	
1992/93	75	1	3	76(42)	102	1	1	103(58)	179
1993/94	90	2	2	95(47)	107	1	2	109(53)	204
1994/95	63	5		68(31)	147	1		148(69)	216
1995/96	71	3		74(39)	116	2		118(60)	192
1996/97	81	6	1	88(36)	152	1	1	154(64)	242
1997/98	86	1		87(39)	132	2		134(61)	221
1998/99	69	4		73(31)	163	0		163(69)	236

Table 14 Units 7 & 15 mountain goat hunter registration permit hunt residency and success, 1992–98

Regulatory year	Successful			Unsuccessful			Total hunters
	resident	Nonresident	Total (%)	resident	Nonresident	Total (%)	
1992/93	64	10	75(29) ^a	183	1	184(71)	258
1993/94	67	3	70(25)	211	0	211(75)	281
1994/95	47	6	53(21)	192	1	194(79) ^b	247
1995/96	59	5	64(28)	166	2	168(72)	232
1996/97	35	5	41(30) ^c	92	4	96(70)	137
1997/98	43	3	46(24)	140	4	144(76)	190
1998/99	34	2	36(15)	204	4	208(85)	244

^aFour unspecified successful hunters.^bOne unspecified unsuccessful.^cOne unspecified successful hunter.

Table 15 Units 7 & 15 mountain goat harvest chronology for 1990–1998

Regulatory year	Harvest periods							Total ^a Harvest
	10–19 August	20–31 August	1–15 September	16–30 September	15–31 October	1–15 November	16–31 November	Unknown
1992/93	13	14	16	34	71	0	3	31
1993/94	18	11	23	42	65	4	1	12
1994/95	17	11	21	18	50	0	1	30
1995/96	20	10	20	23	55	2	3	2
1996/97	11	15	28	33	29	7	5	1
1997/98	19	14	24	29	39	4	2	2
1998/99	26	7	25	15	30	5	1	0

^aNot including Tier II subsistence and unreported harvest.

Table 16 Unit 7 mountain goat harvest percent by transport method, 1992–98. Drawing and Registration hunts are combined.

Regulatory year	Percent of harvest								<i>n</i>
	Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Unknown	
1992/93	19	2	27	2	0	2	44	5	105
1993/94	27	0	24	3	0	0	43	3	94
1994/95	23	1	34	3	0	0	38	1	77
1995/96	20	0	31	6	0	0	42	1	90
1996/97	19	0	34	6	0	1	35	4	68
1997/98	11	1	36	0	0	0	47	4	91
1998/99	18	0	38	3	0	0	38	1	78

Table 17 Unit 15 mountain goat harvest percent by transport method, 1990–98. Drawing and Registration hunts are combined.

Regulatory year	Percent of harvest								<i>n</i>
	Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Unknown	
1992/93	46	4	42	1	0	0	3	4	72
1993/94	39	8	41	0	0	1	6	4	71
1994/95	73	5	23	0	0	0	0	0	44
1995/96	42	6	46	2	0	2	0	2	48
1996/97	54	2	41	0	0	0	0	3	61
1997/98	59	2	36	0	0	0	0	2	42
1998/99	52	3	45	0	0	0	0	0	31

LOCATION

GAME MANAGEMENT UNIT: 8 (5097 mi²)

GEOGRAPHIC DESCRIPTION: Kodiak and Adjacent Islands

BACKGROUND

The mountain goat population in Unit 8 originated from 11 females and 7 males translocated from the Kenai Peninsula to the Hidden Basin area during 1952 and 1953. Success was not realized until 1964 when 26 goats were observed in the Crown Mountain area. The first hunting season was authorized in 1968, and permits have been issued each year since then. Prior to 1986, permit allocation varied between drawing, registration, and tier II (subsistence) permits. Since then, all hunting has been regulated by drawing, with the number of permits available and open areas changing to reflect population trends and goat movements.

From the late 1960s through 1970s, goat populations were lightly harvested and most areas were closed to hunting to encourage colonization. Permits were allocated through the registration or drawing system with a harvest quota of up to 15 goats. During the 1980s, the population continued to increase from an estimated 150 to over 400 animals, and new pockets of goats were observed on the southern end of the island. The permit allocation process switched from a drawing system to a registration system in 1984 and 1985, and a tier II area was also established in 1985. A number of emergency orders were issued during the fall of 1985 when harvest goals were reached. The change from a drawing permit to a registration permit hunt in 1985 resulted in numerous inexperienced goat hunters going afield. Smith (1986) reported high hunter densities, less selectivity, herd shooting, and wanton waste during the 1985 hunting season. In 1986 the drawing system was restored.

Throughout the 1990s, goat populations continued to grow and the management scheme was conservative. Populations were closely monitored and permits were adjusted accordingly. Much of the southern portion of the island, which had been closed to facilitate colonization, was open to limited hunting in 1991. A new hunt area (DG 478) close to the Kodiak road system was opened to hunting in 1995. There are currently 8 permit hunting areas with a total of 168 drawing permits available. Based on data from comprehensive aerial surveys, we estimated that the goat population of Unit 8 in 1999 was 1000 goats. The goat population occupied all available habitat on the island, and we received unconfirmed reports of a goat on Uganik Island.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Maintain a pre hunting population of at least 700 goats with a harvest compromised of at least 50% males.

METHODS

We complete composition counts annually with fixed-wing aircraft in August and early September. During the surveys, priority is given to the 8 permit hunt areas, but if weather and funding permit,

we attempt to survey all goat habitat on Kodiak. We collect data on harvest and hunting effort from mandatory hunter reports and by examining goat horns voluntarily brought in by successful hunters.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Our survey of approximately 90% of the goat range in August and September 1999 yielded a minimum population size of 895 goats. The population continued to increase in the Uyak and Deadman Bay areas, whereas the population is decreasing in the Kizhuyak and Terror Bay drainages. The estimated islandwide population in 1999 was 1000 goats.

Population Composition

Within the permit hunt areas, the kid:adult ratio ranged from 15–24 kids:100 adults from 1994/95 to 1998/99 (Table 1). Kid production declined in 1999 to a ratio of 18.7:100, from an average of 20.6 during the previous 5 years. This decline was precipitated by severe winter weather and delayed vegetative development in the spring of 1999. We did not collect any data on the sex composition of the population during this reporting period.

Distribution and Movements

During the first 3 decades after their introduction to Kodiak, goats gradually occupied pristine habitats near their release area, primarily in the Kizhuyak, Terror, and Hidden Basin drainages. As population density increased, goats began to pioneer new areas. No radio telemetry or other movement studies have been conducted on Kodiak goats. Research in other areas suggests dispersal of males may be driven by competition for females, but dispersal of females may be triggered by diminished food availability (Stevens 1983). During the past decade goats expanded beyond the newly discovered pockets of suitable habitat, and moved into areas not normally considered prime goat range. Goats now occur, in at least small numbers, in most of the suitable habitat on Kodiak Island.

MORTALITY

Harvest

Season and Bag. Goat hunting season for resident and nonresident hunters was open from 1 September to 31 October. The bag limit was 1 goat by drawing permit. Eight permit areas were established with 168 permits issued. Regulations authorize the department to issue up to 250 drawing permits per season (5 AAC 85.040[4]).

Board of Game Actions and Emergency Orders. There were no Board of Game actions or emergency orders during this reporting period. During the 1999–2000 season, the department administratively increased the number of permits available in hunt area DG 478 from 8 to 15 to take advantage of the increased harvestable surplus in that area.

Hunter Harvest. Annual harvest ranged from 44 to 70 goats from 1994/95–1998/99, with a 5-year average of 57.4 (Table 2). Annual harvests increased during each of these years, reflecting an increase in both goat density and permit numbers. Annual harvest ranged from 3 to 19 goats for each of the 8 permit hunts. Males continued to comprise the majority of the goats harvested during each year from 1994/95–1998/99, with a 5-year average of 64.4%.

Hunters have provided goat age (horn ring) data on their report cards since 1994–95 when regulations mandating horn inspection were rescinded. The mean age of goats harvested between 1989–90 and 1993–94 was 3.8 yrs for males and 5.0 yrs for females. During the next 5-year period, 1994/95–1998/99, mean ages were 5.3 years for males and 5.8 years for females (Table 3). These data indicate that hunter derived age data are inconsistent, and little, if any, objective analyses can be derived from them.

Permit Hunts. All goat hunting in the unit is by drawing permit. During this reporting period there were 8 hunt areas (DG 471–478) and the number of permits issued ranged from 135 to 176. Hunters afield ranged from 72–109, with a 5-year average of 60.4% of the permittees participating in the hunt (Table 2). Compliance with the permit hunt conditions by hunters was good; however, permittees who did not hunt frequently failed to return permit reports until receiving reminder letters.

Hunter Residency and Success. Local Unit 8 residents received most of the permits issued between 1994/95–1998/99 (54%), followed by nonlocal Alaska residents (39%), and nonresidents (7%) (Table 4). Annual hunter success ranged 58–65% with a 5-year mean of 61%. Nonresidents were the most successful hunters (77%), followed by local residents (65%) and nonlocal (53%).

Harvest Chronology. Weather patterns largely determine the chronology of harvest and affect hunter success and timing of the hunt. During most years, goat hunters prefer October to hunt goats in Unit 8 (Table 5).

Transport Methods. From 1994/95 to 1998/99 hunters predominantly used aircraft (65%) to access the field (Table 6). Boats (21%) were another important transport method, and off-road vehicles (9%) have become more popular as trails increase and machines become more powerful and reliable.

Other Mortality

Documenting mortality from sources other than hunting is seldom possible because of the remote, rugged nature of goat habitat. Predation by brown bears and golden eagles undoubtedly occurs, but it is probably rare. The low production of kids in some years is probably caused by severe winter weather conditions, but it is unknown whether early postnatal mortality of kids or low initial productivity occurred. The severe winter of 1998–99 yielded reports of a few winter-killed goats in the Hidden Basin and Old Harbor areas. It has been estimated that wounding loss and illegal harvest contribute additional mortality equivalent to 10% of the reported harvest (Van Daele and Smith 1998).

HABITAT

Assessment

Goat habitat on Kodiak Island is relatively secure because it is remote and has little immediate commercial value. Construction and operation of the Terror Lake hydroelectric project, in goat habitat in northern Kodiak Island, has not been detrimental (Smith and Van Daele 1987).

There have been no detailed analyses of goat range or carrying capacity on Kodiak, but survey data suggest that the population is probably near the carrying capacity of the habitat in the north central part of the island where goats first became established. In recently colonized areas of southern Kodiak Island, the population still seemed to be below carrying capacity during this reporting period.

Winter severity is quite variable in the maritime environment where precipitation at lower elevations may occur as either rain or snow. In studying goats on northern Kodiak Island, Hjeljord (1973) observed that goats were at higher elevations in March during a winter with snow cover at sea level but at lower elevations during winters when lower slopes were partly snow-free. Smith and Van Daele (1987) determined that winter distribution was strongly influenced by snow cover, with goats favoring southerly exposed slopes and cliff faces. The lack of a coniferous overstory at lower elevations may adversely affect goats on Kodiak during winters with high snowfall.

NONREGULATORY MANAGEMENT PROBLEMS

Although we suspect that present goat density is at or near carrying capacity in some areas, yet a conservative harvest regime continues to be employed. Research into the relationships between winter severity and carrying capacity could provide managers with more precise estimates of allowable harvests.

CONCLUSIONS AND RECOMMENDATIONS

The goat population was stable in northeastern Kodiak, decreasing in northcentral, and increasing in recently colonized drainages of southern Kodiak. Based on the 1999 comprehensive aerial survey of goat range in Unit 8, we estimated a total of 1000 goats. Severe weather during the winter of 1998–99 exacerbated population declines in some areas and resulted in lower kid:adult ratios in all permit areas. During this reporting period goat harvests increased each year, and percent males in the harvest and hunter success remained above 60%.

The policy of allowing goats to populate vacant habitat by keeping areas with low populations closed to hunting has been effective as we have routinely surpassed our management objectives. Population trends are closely monitored by annual surveys and permits are adjusted accordingly within hunt areas. Recent alterations in goat populations and ranges have prompted us to investigate changing some of the hunt area boundaries. Before acting on any of these changes, however, we will discuss them with the local Advisory Committee, staff from Kodiak National Wildlife Refuge, and other interested parties.

We have reached a pivotal point in goat management on Kodiak as the population now occupies most, if not all, suitable habitat and populations in most areas continue to increase. We should consider shifting our emphasis from encouraging range expansion and increased densities to

limiting the population to a level that will provide sustained hunting opportunities while maintaining habitat quality. We must also consider the relationship between habitat, hunting, and goat viewing opportunities on the Kodiak road system and develop socially and biologically acceptable ways of balancing these potentially conflicting factors.

To achieve these goals, we recommend the following management actions:

- Revise the management objective to include a population goal of 700–1000 goats islandwide, distributed in a manner which has minimal long-term impact on their habitat;
- Work closely with staff from Kodiak National Wildlife Refuge to initiate research into goat habitat, and the impacts of goats on that habitat;
- Evaluate current hunt area boundaries and permit allocations to assure that they adequately reflect the recent changes in goat density and distribution;
- Reestablish the requirement that hunters bring their horns into an ADF&G office for inspection;
- Initiate an investigation into the possible relationships between horn growth and habitat quality;
- Revise hunter handouts with emphasis on sex identification, goat anatomy, and ways to avoid wounding and/or losing goats while hunting; and,
- Work with hunters and nonconsumptive users to explore methods of establishing areas where goats can regularly be seen from the Kodiak road system.

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Table 1 Unit 8 Aerial summer mountain goat composition counts and estimated population size within permit hunt areas, 1994/95–1999/2000.

Hunt Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/hour	Estimated population size
All permit hunt areas	1994/95	579 (81)	140 (21)	24	719	49.2	800
	1995/96	432 (87)	65 (13)	15	479	105.7	--
	1996/97	405 (85)	72 (15)	18	477	94.1	--
	1997/98	495 (83)	101 (17)	20	596	129.0	--
	1998/99	482 (81)	115 (19)	24	597	81.6	--
	1999/2000	684 (84)	128 (16)	19	812	96.2	900
DG 471 Wild Creek - Center Mtn.	1994/95	94 (79)	25 (21)	27	119	--	--
	1995/96	114 (89)	14 (11)	12	128	--	--
	1996/97	113 (84)	21 (16)	19	134	--	--
	1997/98	154 (79)	40 (21)	26	194	--	--
	1998/99	167 (78)	48 (22)	29	215	--	--
	1999/2000	137 (86)	23 (14)	17	160	--	160–180
DG 472 Crown Mtn	1994/95	40 (82)	9 (18)	23	49	--	--
	1995/96	35 (97)	1 (3)	3	36	--	--
	1996/97	37 (80)	9 (20)	24	46	--	--
	1997/98	46 (87)	7 (13)	15	53	--	--
	1998/99	18 (95)	1 (5)	6	19	--	--
	1999/2000	21 (88)	3 (12)	14	24	--	20–50

Table 1 Continued.

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
DG 473	1994/95	93 (74)	33 (26)	36	126	--	--
Hidden Basin -	1995/96	143 (85)	25 (15)	17	168	--	--
Terror Lake	1996/97	101 (89)	12 (11)	12	113	--	--
	1997/98	97 (85)	17 (15)	18	114	--	--
	1998/99	63 (81)	15 (19)	24	78	--	--
	1999/2000	28 (90)	3 (10)	11	31	--	40-80
DG 474	1994/95	55 (75)	18 (25)	33	73	--	--
W. Terror Lake-	1995/96	54 (83)	11 (17)	20	65	--	--
Uganik	1996/97	36 (97)	1 (3)	3	37	--	--
	1997/98	65 (83)	13 (17)	20	78	--	--
	1998/99	33 (85)	6 (15)	18	39	--	--
	1999/2000	44 (92)	4 (8)	9	48	--	40-60
DG 475	1994/95	98 (88)	13 (12)	13	111	--	--
Uyak Bay	1995/96	--	--	--	--	--	--
	1996/97 ^a	24 (71)	10 (29)	42	34	--	--
	1997/98 ^a	23 (100)	0	0	23	--	--
	1998/99	--	--	--	--	--	--
	1999/2000	257 (90)	30 (10)	12	287	--	200

Table 1 Continued.

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/hour	Estimated population size
DG 476 Kiliuda Bay	1994/95	33 (94)	2 (6)	6	35	--	--
	1995/96	--	--	--	--	--	--
	1996/97	--	--	--	--	--	--
	1997/98	--	--	--	--	--	--
	1998/99	42 (84)	8 (16)	19	50	--	--
	1999/2000 ^a	11 (85)	2 (15)	18	13	--	50-60
DG 477 Deadman Bay	1994/95	80 (86)	13 (14)	16	93	--	--
	1995/96	--	--	--	--	--	--
	1996/97	--	--	--	--	--	--
	1997/98	--	--	--	--	--	--
	1998/99 ^a	50 (83)	10 (17)	20	60	--	--
	1999/2000 ^a	92 (83)	19 (17)	21	111	--	130-160
DG 478 Chiniak Bay	1994/95	--	--	--	--	--	--
	1995/96	68 (84)	13 (16)	19	81	--	--
	1996/97	66 (81)	15 (19)	23	81	--	--
	1997/98	110 (79)	24 (21)	22	134	--	--
	1998/99	109 (81)	26 (19)	23	135	--	--
	1999/2000	94 (80)	24 (20)	26	118	--	100-120

^a partial survey

Table 2 Unit 8 mountain goat harvest data by permit hunt, 1994/95–1998/99.

Hunt Area	Regulatory year	Permits Issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Female (%)	Unknown	Illegal	Total harvest
All permit hunts	1994/95	135	39	42	58	22 (52)	20 (48)	0	0	44
	1995/96	141	44	38	62	30 (61)	19 (39)	0	0	49
	1996/97	176	44	40	60	37 (62)	20 (34)	2	0	59
	1997/98	168	35	40	60	47 (72)	17 (28)	1	0	65
	1998/99	168	36	35	65	49 (70)	21 (30)	0	0	70
DG 471	1993/94	30	43	44	56	6 (67)	3 (33)	0	0	3
Wild Creek	1994/95	25	64	44	56	5 (56)	4 (44)	0	0	3
	1995/96	25	44	29	71	6 (60)	4 (40)	0	0	10
	1996/97	30	47	37	63	6 (60)	4 (40)	0	0	10
	1997/98	30	34	63	37	6 (86)	1 (14)	0	0	7
	1998/99	30	50	27	73	8 (73)	2 (27)	0	0	11
DG 472	1993/94	8	37	0	100	3 (60)	2 (40)	0	0	5
Crown Mtn	1994/95	10	40	33	67	1 (25)	3 (75)	0	0	4
	1995/96	8	50	25	75	1 (33)	2 (67)	0	0	3
	1996/97	10	20	37	63	2 (40)	2 (40)	1	0	5
	1997/98	10	30	57	43	0 (--)	2 (67)	1	0	3
	1998/99	10	50	40	60	1 (33)	2 (67)	0	0	3
DG 473	1994/95	25	45	33	67	3 (37)	5 (63)	0	0	8
Hidden Basin	1995/96	25	40	20	80	6 (50)	6 (50)	0	0	12
	1996/97	31	39	37	63	9 (75)	3 (25)	0	0	12
	1997/98	30	13	27	73	14 (74)	5 (26)	0	0	19
	1998/99	30	17	36	64	13 (81)	3 (19)	0	0	16

Table 2 Continued.

Hunt Area	Regulatory year	Permits Issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Female (%)	Unknown	Illegal	Total harvest
DG 474 W. Terror Lake	1994/95	15	33	40	60	6 (60)	4 (40)	0	0	10
	1995/96	10	50	20	80	3 (75)	1 (25)	0	0	4
	1996/97	30	50	53	47	4 (57)	3 (43)	0	0	7
	1997/98	15	53	14	86	6 (100)	0 (--)	0	0	6
	1998/99	15	53	14	86	2 (33)	4 (67)	0	0	6
DG 475 Uyak Bay	1994/95	30	57	62	38	3 (60)	2 (40)	0	0	5
	1995/96	35	49	51	49	5 (63)	3 (47)	0	0	8
	1996/97	35	60	50	50	1 (14)	6 (86)	0	0	7
	1997/98	35	51	53	47	5 (63)	3 (37)	0	0	8
	1998/99	35	46	68	32	4 (67)	2 (33)	0	0	6
DG 476 Kiliuda Bay	1994/95	20	65	57	43	2 (67)	1 (33)	0	0	3
	1995/96	20	60	50	50	2 (50)	2 (50)	0	0	4
	1996/97	20	35	38	62	8 (100)	0 (0)	0	0	8
	1997/98	20	25	27	73	9 (82)	2 (18)	0	0	11
	1998/99	20	45	27	73	6 (75)	2 (25)	0	0	8
DG 477 Deadman Bay	1994/95	10	20	62	38	2 (67)	1 (33)	0	0	3
	1995/96	10	30	37	63	4 (80)	1 (20)	0	0	5
	1996/97	12	50	17	83	3 (60)	2 (40)	0	0	5
	1997/98	20	40	33	67	6 (75)	2 (25)	0	0	8
	1998/99	20	20	17	83	11 (73)	4 (27)	0	0	15
DG 478 Chiniak Bay	1994/95	--	--	--	--	--	--	--	--	--
	1995/96	8	0	37	63	4 (80)	1 (20)	0	0	5
	1996/97	8	13	29	71	3 (60)	2 (40)	0	0	5
	1997/98	8	33	50	50	1 (33)	2 (67)	0	0	3
	1998/99	8	13	29	71	4 (80)	1 (20)	0	0	5

Table 3 Unit 8 mountain goat harvest mean age data from horn rings, 1989/90–1998/99.

Regulatory Year	Males	<i>n</i>	Females	<i>n</i>
1989/90 ^a	3.3	(14)	3.8	(11)
1990/91 ^a	4.0	(17)	5.4	(9)
1991/92 ^a	3.8	(17)	4.0	(15)
1992/93 ^a	3.8	(21)	4.7	(14)
1993/94 ^a	3.8	(31)	3.7	(16)
1994/95 ^b	4.7	(21)	5.7	(19)
1995/96 ^b	5.9	(18)	6.7	(7)
1996/97 ^b	5.2	(17)	6.2	(9)
1997/98 ^b	5.5	(42)	5.6	(12)
1998/99 ^b	5.3	(40)	5.5	(14)

^a mandatory horn inspections required.

^b hunters report goat age with report card.

Table 4 Unit 8 mountain goat hunter residence and success, 1994/95–1998/99.

Regulatory year	Successful					Unsuccessful					Total hunters
	Local resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total I	(%)	
1994/95	22	15	5	42	(58)	14	18	0	32	(42)	74
1995/96	30	17	2	49	(62)	7	20	3	30	(53)	79
1996/97	36	18	5	59	(60)	21	16	2	39	(40)	98
1997/98	41	21	3	65	(60)	24	20	0	44	(40)	109
1998/99	35	26	9	70	(65)	23	12	2	37	(35)	107

Table 5 Unit 8 mountain goat harvest chronology percent by month, 1994/95–1998/99.

Area	Regulatory year	Harvest periods		<i>n</i>
		September	October	
All permit hunts	1994/95	43 %	57 %	42
	1995/96	37 %	63 %	49
	1996/97	46 %	54 %	59
	1997/98	52 %	48 %	65
	1998/99	37 %	63 %	70

Table 6 Unit 8 mountain goat hunter transport method (percent in parentheses), 1994/95–1998/99.

Regulatory year	Transportation method						Unknown	Total
	Aircraft	Boat	3- or 4 Wheeler	ORV	Highway vehicle	Snow- machine		
1994/95	56 (86)	9 (14)	0 (--)	0 (--)	0 (--)	0 (--)	0 (--)	65
1995/96	50 (63)	18 (23)	3 (4)	8 (10)	0 (--)	0 (--)	0 (--)	79
1996/97	56 (57)	31 (32)	7 (7)	0 (--)	3 (3)	1 (1)	0 (--)	98
1997/98	70 (64)	18 (17)	13 (12)	0 (--)	7 (6)	0 (--)	1 (1)	109
1998/99	66 (62)	22 (21)	9 (8)	1 (1)	5 (5)	0 (--)	4 (3)	107

LOCATION

GAME MANAGEMENT UNIT: 11 (13,300 mi²)

GEOGRAPHIC DESCRIPTION: Wrangell Mountains

BACKGROUND

Hunters have harvested mountain goats in Unit 11 for at least 30 years. Harvest data for goats were not collected before 1972. Although seasons and bag limits were liberal, harvests before 1972 were probably low. The season length and bag limit were reduced in the mid-1970s because of an increase in hunting pressure and harvest. Mountain goat harvests have been controlled by a registration hunt since 1980.

The MacColl Ridge trend count area was established in 1970 to obtain sex and age composition data and monitor population trends. Additional aerial survey data on mountain goats in other portions of Unit 11 have been collected only periodically in conjunction with sheep counts.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Maintain harvest of mountain goats to under 10% of the estimated mountain goat population within the hunt area.

METHODS

Department personnel conduct aerial surveys to determine sex and age composition and population trends on MacColl Ridge. MacColl Ridge is located north of the Chitina River in the southeastern portion of Unit 11. Additional mountain goat data are collected periodically during aerial surveys of sheep trend count areas. Harvest and hunting pressure are controlled by registration permit.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

In both the 1998 and 1999 surveys of MacColl Ridge, we counted 74 goats, 12% higher than the 1997 count of 66 (Table 1). Until this year, the highest count on MacColl Ridge was 65 goats obtained in 1981 during a helicopter survey. The current count on MacColl Ridge is 42% above the long-term count average of 52 animals.

Biologists estimate 700 mountain goats inhabit the southern Wrangell and Chugach Mountains in Unit 11. This population estimate was obtained by combining survey results from different count areas in Unit 11 between 1973 and 1984. If a count area was surveyed more than once, the highest count was used in the population estimate.

Population Composition

The ratio of kids:adults observed on MacColl Ridge during 1999 was 16:100; kids composed 14% of goats observed (Table 1). Kid production declined 33% in 1999 and was the lowest observed in seven years. Recruitment was especially high between 1995 and 1998, averaging 14 kids observed per year compared to an average of 8 kids per year between 1991 and 1993. The number of adults observed in 1998 and 1999 increased from the previous 3 years because of the earlier high kid production and survival.

Distribution and Movements

In the past, observers have tallied approximately 400 mountain goats during aerial surveys in the Wrangell Mountains, north of the Chitina River between the Cheshnina River and the Canadian Border. The Kennicott, Hawkins, and Barnard Glaciers, MacColl Ridge, and McCarthy Creek supported the largest number of animals. Nearly 300 goats have been counted south of the Chitina River in that portion of the Chugach Mountains from the Copper River east to the Canadian Border.

Information on movements is limited, and major rutting and kidding areas are unknown. Field observations indicate seasonal altitudinal movements; goats often use lower elevations during winter. East-west movements also occur; animals have been observed traveling between the Kotsina and Kuskalana Rivers and between Kennicott Glacier and McCarthy Creek.

MORTALITY

Harvest

Seasons and Bag Limits. The open season for resident and nonresident hunters was 1 September to 30 November; the bag limit was 1 goat by registration permit only.

Board of Game Actions and Emergency Orders. In 1980 the Board of Game established the Unit 11-goat hunt as a registration permit hunt only. This action was necessary because much of the unit was included in Wrangell-Saint Elias National Park/Preserve, concentrating sport hunting for goats on preserve lands. Only subsistence hunting by local rural residents was allowed on park lands. In 1986, the goat season was reduced by 31 days, aligning the closing date with adjacent Unit 6. Starting in 1989 guides were required for all nonresident mountain goat hunters.

Federal Subsistence Seasons and Bag Limits. In 1990 the federal government assumed management of subsistence hunting on federal lands. At that time, the Federal Subsistence Board determined there was not subsistence hunting of mountain goats in Unit 11 and subsequently closed the "hard park" to subsistence mountain goat hunting by local rural residents. In 1999 The National Park Service determined there was a subsistence use of mountain goats by local rural residents in the Park. A season was established with open dates of 25 August to 31 December. Hunting was controlled by registration permit issued by the National Park Service to residents of designated subsistence communities. The bag limit was one goat, and a harvest quota of 45 mountain goats for both the State and Federal hunts was established.

Hunter Harvest. Hunters killed 18 mountain goats during the 1997 season and 17 in 1998 for the state registration hunt (RG 580). The average yearly take since 1980 was 16 goats (range = 6–

30). The 1998 harvest comprised 12 (71%) males and 5 (29%) females. Males composed the majority of animals taken (Table 2) during this reporting period. High male harvest is attributable to the selection of larger trophy animals, especially by nonresidents on guided hunts. There were no mountain goats reported killed in the federal subsistence hunt during the 1999 season.

Hunter Residency and Success. We issued 48 state registration hunt permits in 1998. The number of permits issued for this hunt fluctuates between 50 and 70, with no trend evident in the hunting pressure. The highest number of permits ever issued for this hunt was 97 in 1986. The hunter success rate was 67% in 1997 and 59% in 1998. The hunter success rate is considered high for goat hunters in Unit 11 (Table 2). Successful hunters reported spending 2.4 days in the field compared with 4.2 days for unsuccessful hunters in 1998. The hunting effort reported by Unit 11 goat hunters changes little each year. Nonresident hunters took 8 goats in 1998, accounting for 47% of the harvest compared with 29% of the harvest taken by non-local Alaskan residents and 24% by local rural residents (Table 3). Since 1986, nonresidents have taken 63% of goats harvested and have had a higher success rate (74%) than residents (36%). The National Park Service issued 15 permits to rural residents of communities with a subsistence designation for mountain goats. There were no reported successful permittees in the federal hunt. Unsuccessful federal hunters reported spending 4.4 days hunting.

Harvest Chronology. In 1998, 75% of the harvest occurred during the initial 3 weeks of the season (Table 4). During the last 10 years, the highest harvests have occurred early in the season. Before 1986 more goats were taken later in the season, especially in October. The change in harvest chronology is partially the result of an increase in nonresident hunters combining sheep and goat hunts during the first 20 days of September. Goats killed later in the season are usually taken by residents hunting only mountain goats.

Transport Methods. Most successful goat hunters use aircraft. Highway vehicles are also a popular method of transportation. Transportation methods used by goat hunters in Unit 11 have changed little over the years (Table 5). Since the use of aircraft is prohibited for subsistence hunting in the Park, the most important method of transportation for federal subsistence hunters is riverboat and 4-wheelers.

Other Mortality

Wolf predation of goats has been observed in portions of the unit. Reports by trappers and local residents suggest wolf predation may be common; however, predation rates have not been determined.

HABITAT

Assessment

The Wrangell Mountains and northern portion of the Chugach Mountains are part of the northernmost extension of mountain goat range in Alaska. However, goat habitat in these areas is limited. Goats are in substantial numbers north of the Chitina River, from east of the Lakina River to the Canadian border. The remainder of the Wrangell Mountains west of the Lakina River is marginal goat habitat. Goat habitat in the Chugach Range south of the Chitina River may be more suitable.

CONCLUSIONS AND RECOMMENDATIONS

The count of mountain goats in the MacColl Ridge trend area during the last 2 years was the highest ever observed. The biggest change was the observed increase in adults, while kid production, which had been high for four years, declined slightly. Between 1994 and 1998 survey results indicated the highest kid production and/or survival ever observed on MacColl ridge.

Interpretation of annual survey data is difficult because we do not know if small yearly changes in the number of mountain goats observed on MacColl Ridge reflect actual population fluctuations or survey variables. Mountain goats are among the most difficult big game species to count because of vegetation and rugged terrain in the trend count areas. Also, the behavioral response of mountain goats to approaching aircraft is to hide in caves, under ledges, and in dense vegetation. Counts are conducted at approximately the same time each year in an attempt to minimize the effect of movements on survey results.

The mountain goat population north of the Chitina River has increased to the highest level observed in recent years; trends south of the Chitina River are unknown because of poor survey coverage. Mountain goats are numerous only in limited areas where habitat conditions are favorable. Overall, goat densities in Unit 11 are much lower than in areas with more favorable habitat; such as the Kenai Peninsula.

Goats were hunted throughout their range during the 1970s, and hunting pressure was greater than in recent times. National Park Service and Federal Subsistence Board hunting regulations now restrict nonsubsistence goat hunting to Preserve lands around McCarthy, MacColl Ridge, Hawkins and Barnard Glaciers. MacColl Ridge receives some of the heaviest hunting pressure in the unit, especially for guided hunts. However, during this report period harvests were not concentrated enough in any area to result in localized overharvests.

The federal subsistence hunt in the Park designated lands should not present a management problem for the state hunt because hunters participating in the state hunt are limited to Preserve lands. The new federal subsistence hunt allows hunting of mountain goats in portions of Unit 11 that have been protected for over ten years. Harvests are expected to remain low under the federal hunt because the number of individuals eligible for subsistence permits is limited. Hunt areas are, for the most part, very remote and federal regulations prohibiting the use of aircraft for subsistence hunting limit access.

Mountain goats in the popular hunting areas of Unit 11 have sustained annual harvest rates of 10% of the observed population. This rate of harvest is probably sustainable because observed counts represent a minimum population estimate. However, heavy harvests from MacColl Ridge and Barnard and Hawkins Glaciers during periods with low kid recruitment or increased predation could cause a decline in the goat population in those areas. In addition to the yearly trend count on MacColl Ridge, goats should be surveyed periodically in heavily hunted areas such as Hawkins and Barnard Glaciers. Harvest rates are currently not a concern in other areas in the unit.

I recommend closing the hunting season by emergency order as soon as the harvest from MacColl Ridge and Hawkins and Barnard Glaciers exceeds 10% of the observed goat

population. Timely emergency closures will be difficult because most of the harvest takes place in only a few days early in the season. The annual harvest from Unit 11 should not exceed 35 goats for more than 1 year; if it does, we should implement regulations to reduce the harvest.

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Table 1 Unit 11 MacColl Ridge trend count area mountain goat composition counts and estimated population size, 1994–99

Area	Regulatory year	Adults (%)	Kids (%)	Unk.	Kids: 100 adults	Total goats observed	Estimated population size ^a
MacColl Ridge	1994–95	39 (78)	11 (22)	0	28	50	50
	1995–96	31 (69)	14 (31)	0	45	45	45
	1996–97	47 (78)	13 (22)	0	28	60	60
	1997–98	50 (76)	16 (24)	0	32	66	66
	1998–99	59 (80)	15 (20)	0	25	74	74
	1999–2000	64 (86)	10 (14)	0	16	74	74

^a Estimate considered to be total count as all goat habitat on ridge counted.

Table 2 Unit 11 mountain goat harvest data by permit hunt, 1994–98

Hunt Nr. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent Successful Hunters	Males (%)	Females (%)	Unk.	Illegal	Total harvest
RG580	1994–95	52	41	31	27	12 (86)	2 (14)	0	0	14
RG580	1995–96	60	50	28	22	12 (92)	1 (8)	0	0	13
RG580	1996–97	68	35	31	34	16 (70)	7 (30)	0	0	23
RG580	1997–98	53	48	17	35	14 (78)	4 (22)	0	0	18
RG580	1998–99	48	37	26	37	12 (71)	5 (29)	0	0	17

Table 3 Unit 11 mountain goat hunter residency and success, 1994–98

Regulatory year	Successful				Unsuccessful				Total hunters
	Local ^a resident	Nonlocal resident	Nonresident	Total (%)	Local ^a resident	Nonlocal resident	Non-resident	Total (%)	
1994–95	2	2	10	14 (47)	2	11	3	16 (53)	30
1995–96	0	3	10	13 (43)	4	10	3	17 (57)	30
1996–97	2	3	18	23 (52)	2	14	5	21 (48)	44
1997–98	2	8	8	18 (67)	2	5	2	9 (33)	27
1998–99	4	5	8	17 (59)	2	7	3	12 (41)	29

^a “local resident” means resident of Unit 11, 13, or that portion of Unit 12 along the Nabesna Road.

Table 4 Unit 11 mountain goat harvest chronology percent by month, 1994–98

Regulatory year	September				October				1–30	<i>n</i>
	1–7	8–15	16–23	24–30	1–7	8–15	16–23	24–31		
1994–95	14	29	14	--	7	29	7	--	--	14
1995–96	38	31	--	15	8	8	--	--	--	13
1996–97	22	30	13	9	17	9	--	--	--	23
1997–98	61	17	11	5	5	--	--	--	--	18
1998–99	44	12	19	12	12	--	--	--	--	16

Table 5 Unit 11 mountain goat harvest percent by transport method, 1994–98

Regulatory year	Percent of harvest							<i>n</i>
	Airplane	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway Vehicle	Unknown	
1994–95	86	7	--	--	--	7	--	14
1995–96	92	0	--	--	8	--	--	13
1996–97	92	4	4	--	--	--	--	23
1997–98	100	--	--	--	--	--	--	17
1998–99	100	--	--	--	--	--	--	12

LOCATION

GAME MANAGEMENT UNIT: Units 13D and 14 (12,370 mi²)

GEOGRAPHIC DESCRIPTION: Talkeetna Mountains and western Chugach Mountains

BACKGROUND

The first goat survey in Unit 13D was conducted in 1959. The first comprehensive goat survey in Unit 14 was completed in 1972. Periodic surveys have been conducted since then in both units.

During the last decade, the goat population in the western Chugach Mountains (Units 13D, 14A, and 14C) has increased slightly. The number of goats observed during aerial surveys in Unit 14C ranged from 326 to 530 between 1982 and 1989. During a complete count of Unit 14C in 1994, 619 goats were observed. The goat population in the Talkeetna Mountains (Unit 14A and 14B) has been chronically low and probably has decreased in recent years.

Seasons and bag limits for goats in these areas have varied since statehood. During the mid-1960s, regulations for Units 13 and 14 were most liberal, with a 144-day goat hunting season (10 August through 31 December) and 2-goat bag limit. Unit 14 changed to a 1-goat bag limit in 1967, but hunters in Unit 13D could harvest 2 goats until 1975. In the 1970s the hunting season in Unit 14 began in early August or September and ran until 15 November. In the early 1980s goat hunting in the western Chugach Mountains was at its most restricted stage, with only 50 or 100 drawing permits issued for Units 14B and 14C and portions of 14A. Since 1984 most mountain goat hunting in Unit 14 has been under a registration permit season. Unit 13D was opened in 1987 under a drawing permit hunt after a 10-year closure. The harvest was limited to billies during 1987 and 1988 but was liberalized to either sex in 1989. In Unit 14A north of the Matanuska River, goat hunting has been closed since 1986. The hunting season for goats in Unit 14B has been closed since 1990 (by emergency order in 1990 and 1991).

With the exception of 1969–1972, when none of Unit 14C was closed to hunting, most of Unit 14C has been closed to goat hunting since the early 1960s. First, the drainages from Potter to Girdwood (Rainbow Closed Area) were closed. In 1973, the then recently created Chugach State Park, encompassing most of the mountains west of the Lake George and Twentymile River drainages, was closed to goat hunting. Historically, these closed areas have not included a substantial segment of the goat population in Unit 14C; however, more goats have been observed in the park in recent years.

During this reporting period, numbers of hunters were stable in Units 13D and 14, and few goats were harvested in Units 13D and 14A (Tables 6 and 7). Annual goat harvests in Unit 14C ranged from 26 to 38, with no discernible trend (Table 5).

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Unit 13D (Chugach Mountains)

- Maintain a pre hunting season population of at least 100 goats.

Units 14A and 14B (Talkeetna Mountains)

- Allow the population to reach an observable minimum of 50 goats before allowing harvest, at which time annual harvest should not exceed 5% of observable goats and should comprise at least 60% males.

Unit 14A (Chugach Mountains)

- Maintain a minimum observable population of 60 goats that will sustain an annual harvest of 7% of observable goats and at least 70% males.

Unit 14C (Chugach Mountains)

- Maintain a population of at least 500 goats that will sustain an annual harvest of 25 goats, comprising at least 60% males.

METHODS

We monitored sex and age composition and trend of goat populations through periodic aerial surveys. We monitored harvests by requiring successful hunters to report harvests within 5 or 10 days of kill depending on hunt location. In addition, all hunters were required to return hunt reports, which prompted nearly 100% compliance.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Because of limited funding, we conducted few goat surveys in Units 14 and 13D (Tables 1–4). Partial surveys were conducted in Units 14A and 14B during 1995 and 1998. Partial surveys were also conducted in 1994 and 1995 in Unit 13D. A complete survey was conducted in Unit 14C in 1994; partial surveys were flown in 1995 to 1998.

Goat populations are increasing slowly in the western Chugach Mountains. Aerial survey data collected over the past several years indicate that at least 1000 goats inhabited the western Chugach and Talkeetna Mountains (Tables 1–4).

Variations in count conditions and movement may account for some of the annual fluctuations in numbers. Late evening surveys were best for observing goats. We counted the largest number of goats when we flew surveys in the evening instead of early morning to midday.

Population Composition

Kids comprised 23–25% of observed goats in Unit 13D, 22–24% in Unit 14A, 8–18% in Unit 14B, and 17–23% in Unit 14C.

Distribution and Movements

Goats were seldom far from escape cover that includes broken, rocky, steep terrain. Goat distribution during summer has been documented from aerial surveys. During summer, goats were found feeding in early morning and late evening on open grassy slopes, often adjacent to glaciers or snowfields. During midday goats seek relief from the heat in dense shrub cover, on ice fields or glaciers, and under rocky outcrops.

Winter range often occupies steep, timbered hillsides, or windblown slopes; however, little is known about precise winter distribution or kidding or rutting areas. Recently, limited winter surveys in Unit 14C have been initiated to gather information about goat wintering areas. This winter survey data is not available at the time of this report.

In Unit 13, mountain goats chiefly inhabit Unit 13D in the Chugach Mountains. Occasionally an animal is observed in the Talkeetna Mountains portion of Unit 13, and a small population inhabits the Chulitna Mountains near Cantwell. These goat populations are on the northernmost edge of mountain goat range. Only goats in Unit 13D are hunted. We believe the number of mountain goats in Unit 13 is influenced largely by winter weather and secondarily by predation. Greatly reduced goat numbers in Unit 13 have been attributed to deep snowfall during the early 1970s.

Most mountain goats in Unit 14 occupy the Chugach Mountains; however, small numbers occur in the Talkeetna Mountains. Given favorable winter conditions, low predator populations, and low, controlled harvest rates, goats may continue to increase in the Chugach Mountains portion of the unit. The Talkeetna Mountains are the northern limit of mountain goat range and may be marginal habitat, unable to support a large goat population. A decline in goat numbers in the Talkeetna Mountains during this reporting period was attributed to severe winters and an increasing predator population.

MORTALITY

Harvest

Seasons and Bag Limits. In Unit 13D the goat hunting season for residents and nonresidents was 10 August–20 September. From 1994 to 1998 the bag limit was 1 goat by drawing permit; the taking of kids and nannies accompanied by kids was prohibited.

In Units 14A (south of the Matanuska River) and 14C, the hunting season for residents and nonresidents was 1 September–31 October. In Unit 14C goats could only be taken by bow and arrow from 16 October through 31 October. The bag limit was 1 goat by registration permit. In addition, there were 2 drawing hunts in Unit 14C, one in the East Fork of the Eklutna River drainage and the other in the Glacier and Winner creek drainages. Both hunts were open from the day after Labor Day to October 15. The bag limit was 1 goat.

Board of Game Actions and Emergency Orders. In 1995 the board authorized 2 drawing permit hunts for goats in Unit 14C, one in the East Fork of the Eklutna River in Chugach State Park and the other in the Glacier and Winner creek drainages near Girdwood.

Hunter Harvest. A hunting season was initiated in Unit 13D in 1987 after having been closed since 1978. Harvests have been low (Table 5). Those portions of Unit 14 open to goat hunting were changed from a drawing permit hunt to a registration permit hunt in 1984. This action caused a substantial increase in the Unit 14C harvest. Most of this increase was in the Lake George drainage because it supports a high density of goats and is easily accessible by aircraft. The last 2 weeks of October (16–31 October) were restricted to archery hunting; however, few archers participate in this late archery-only season (Table 6). Likewise, the Twentymile River goat registration hunt is also archery only October 16–31 (Table 6).

Permit Hunts. The number of goat registration and drawing permits issued for Unit 14 ranged from 199 to 251 during this reporting period (Table 6). The number of Unit 14C drawing permits issued is based on the number of goats observed during surveys. During this reporting period the number of Unit 14C drawing permits issued was increased from 8 to 13 (Table 6). Thirty-five drawing permits were issued for the eastern portion of Unit 13D during each year (Table 7).

Hunter Residency and Success. Most goat hunters in Units 13 are nonlocal residents (Table 8). Most goat hunters in Unit 14 are local residents (Table 9).

Success rates from 1994 to 1998 in Unit 13D have ranged from 10% to 58% (Table 8). Likewise, success rates during this reporting period in Unit 14 have ranged from 23% to 38% (Table 9). In both units, nonresidents typically experienced higher rates of success than did resident hunters (Tables 8 and 9). Nonresidents are required to be accompanied by a registered guide to hunt goats in Alaska, guided hunters typically have a higher success rate than unguided hunters.

Harvest Chronology. Season dates for Unit 14 registration hunts occur from 1 September–31 October. In most years, harvest is distributed approximately equal between September and October in the unit (Table 10). Harvests in Unit 13D were too small to evaluate chronologically; season dates were earlier than Unit 14, occurring from 10 August–20 September.

Weather plays an important role in the timing of hunts because conditions often deteriorate rapidly during the last weeks of October. Season dates and suitable conditions for hunting other big game species also affect timing of goat hunts.

Transport Methods. Most successful hunters use airplanes and highway vehicles in Unit 13D (Table 11). In Unit 14A and the Lake George portion of Unit 14C, aircraft remain the primary mode of transport for successful hunters (Table 12). In the Twentymile River drainage of Unit 14C, airplanes, highway vehicles, and boats are used approximately equally, except in years with low water levels (e.g., 1996) when boat access is difficult.

HABITAT

Assessment

Habitat condition has not been assessed in Units 13D and 14. Healthy kid crops in the western Chugach goat population and increasing numbers of goats in Unit 14C indicate that goats may still be below carrying capacity in these areas. Winter weather, particularly deep snow and heavy icing, are believed to be the limiting factors in the western Chugach Mountains.

CONCLUSIONS AND RECOMMENDATIONS

All management objectives were met. We conducted aerial surveys primarily during evening hours when goats were feeding and more easily observed. Because of this, our estimates of the mountain goat population have improved since 1988. This may account, in part, for the substantial increase in the number of goats observed in Unit 14C since 1989. At least 25 goats were harvested in Unit 14C annually during this reporting period, and goat harvests averaged 67% males. With the exception of 1997, less than 7% of observed goats were harvested annually in Unit 14A, and harvests averaged 82% males. Goat season remains closed in the Talkeetna Mountains portion of Unit 14.

We should continue to monitor mountain goat populations; however, because of the low harvest in Unit 13D and 14A, goats need to be surveyed only every 3 years. In Unit 14C, because of a relatively large harvest, budget limitations, and an apparent expanding goat population, surveys should continue to be conducted at least biennially, unless there is severe winter weather.

Management objectives need to reflect management philosophy. The Talkeetna Mountains portions of Units 14A and 14B appear to be marginal habitat, and before hunting is allowed in these areas, there should be a minimum observable population of 50 goats and harvest should not exceed 5% of observed goats. Maximum allowable harvest should not exceed 7% of the number of goats observed during surveys in the Chugach Mountains.

Current season and bag limits are appropriate; however, goat populations in Unit 14 need to be monitored closely to prevent overharvesting.

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Table 1 Unit 13D aerial mountain goat composition counts and estimated population size, 1994–98

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Goats Observed	Goats /hour
1994/95 ^a	36 (75)	12 (25)	33	48	16
1995/96 ^b	50 (77)	15 (23)	30	65	22
1996/97 ^c					
1997/98 ^c					
1998/99 ^c					

^a Partial survey (count areas 5, 7, 16).

^b Partial survey (count areas 11, 12).

^c No surveys conducted.

Table 2 Unit 14A, Chugach Mountains, aerial mountain goat composition counts and estimated population size, 1994–98

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour
1994/95 ^b					
1995/96 ^a	94 (76)	29 (24)	31	123	27
1996/97 ^b					
1997/98 ^b					
1998/99	90 (78)	25 (22)	28	115	25.5

^a Partial survey (east of Metal Creek).

^b No surveys conducted.

Table 3 Unit 14A and 14B, Talkeetna Mountains, aerial mountain goat composition counts and estimated population size, 1994–98

Regulatory Year	Adults (%)	Kids (%)	Kids: 100 adults	Total Goats Observed	Goats /hour
1994/95 ^a					
1995/96 ^b	22 (92)	2 (8)	9	24	
1996/97 ^a					
1997/98 ^a					
1998/99	14 (82)	3 (18)	21	17	

^a No surveys conducted.

^b Partial survey (north side of Sheep River, part of Iron Creek, upper Kashwitna, and North Fork Kashwitna).

Table 4 Unit 14C aerial mountain goat composition counts and estimated population size, 1994–98^a

Regulatory Year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour ^b	Estimated population size ^c
1994/95	495 (83)	124 (17)	25	619	72	750
1995/96 ^d	457 (84)	88 (16)	19	545	61	800
1996/97 ^e	149 (79)	39 (21)	26	188		
1997/98 ^f	112 (77)	34 (23)	30	146		
1998/99 ^f	95 (77)	29 (23)	31	124		

^a Data include all goats observed in Unit 14C; S&I reports prior to 1984 included only goats in registration hunt areas.

^b Number does not include goats counted incidental to sheep surveys or Penguin Creek.

^c Based on 80–85% sightability (snow conditions).

^d Partial survey (Twentymile River, Lake George drainage, East Fork of Hunter Creek, East Fork Eklutna, Glacier and Penguin Creeks).

^e Partial survey (Bird and Penguin Creeks, and those goats counted incidental to Unit 14C sheep surveys).

^f Partial survey (goats counted incidental to sheep surveys; Lake George and Twentymile River not counted).

Table 5 Annual mountain goat harvest by unit, 1994–98

Regulatory Year	Unit				Total
	13D ^a	14A ^b	14B ^c	14C ^d	
1994/95	2	6		26	34
1995/96	7	4		28	39
1996/97	7	5		29	41
1997/98	6	10		38	54
1998/99	5	7		26	38

^a Drawing permit only.

^b Registration permit only.

^c Closed to mountain goat hunting.

^d Registration permit only (1994/95); both registration and drawing permits (1995/96 to 1998/99).

Table 6 Unit 14 mountain goat harvest data by permit hunt, 1994–98

Area ^a	Regulatory Year	Permits issued	Percent did not hunt ^b	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total harvest
RG866	1994/95	32	31	73	27	4	(67)	2	(33)	6
Unit 14A	1995/96	51	61	75	25	3	(60)	2	(40)	5
	1996/97	47	60	74	26	5	(100)	0	(0)	5
	1997/98	38	26	64	36	9	(90)	1	(10)	10
	1998/99	72	50	81	19	6	(86)	1	(14)	7
DG852	1995/96	3	0	67	33	1	(100)	0	(0)	1
Unit 14C	1996/97	3	33	0	100	0	(0)	2	(100)	2
East Eklutna	1997/98	3	0	100	0	0	(0)	0	(0)	0
	1998/99	5	33	50	50	2	(100)	0	(0)	2
DG856	1995/96	5	0	60	40	2	(100)	0	(0)	2
Unit 14C	1996/97	5	20	50	50	2	(100)	0	(0)	2
Glacier Ck.	1997/98	5	0	0	100	1	(20)	4	(80)	5
	1998/99	8	38	80	20	0	(0)	1	(100)	1
RG868	1994/95	93	50	79	21	8	(80)	2	(20)	10
Unit 14C	1995/96	90	41	87	13	6	(86)	1	(14)	7
Twentymile	1996/97	95	54	86	14	5	(83)	1	(17)	6
River	1997/98	82	43	81	19	6	(67)	3	(33)	9
	1998/99	73	52	80	20	4	(57)	3	(43)	7
RG869	1994/95	116	42	76	24	7	(44)	9	(56)	16
Unit 14C	1995/96	99	40	71	29	10	(59)	7	(41)	17
Lake	1996/97	77	29	60	40	14	(70)	6	(30)	20
George	1997/98	71	41	43	57	19	(79)	5	(21)	24
	1998/99	75	52	56	44	11	(69)	5	(31)	16

Table 6 Continued

Table 6 Continued

Area ^a	Regulatory Year	Permits issued	Percent did not hunt ^b	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total harvest
RG878	1994/95	1	100			0	(0)	0	(0)	0
Unit 14C	1995/96	3	33	100	0	0	(0)	0	(0)	0
Twentymile River	1996/97	2	50	100	0	0	(0)	0	(0)	0
(archery)	1997/98	0								
	1998/99	1	100			0	(0)	0	(0)	0
RG879	1994/95	4	100			0	(0)	0	(0)	0
Unit 14C	1995/96	0								
Lake George	1996/97	3	67	100	0	0	(0)	0	(0)	0
(archery)	1997/98	0								
	1998/99	1	100			0	(0)	0	(0)	0
Totals for all	1994/95	214	47	77	23	15	(58)	11	(42)	26
Unit 14C	1995/96	200	39	78	22	19	(70)	8	(30)	27
	1996/97	185	42	72	28	21	(70)	9	(30)	30
	1997/98	161	40	61	39	26	(68)	12	(32)	38
	1998/99	163	51	67	33	17	(65)	9	(35)	26
Totals for all	1994/95	246	45	77	23	19	(59)	13	(41)	32
Unit 14	1995/96	251	43	77	23	22	(69)	10	(31)	32
	1996/97	232	46	72	28	26	(74)	9	(26)	35
	1997/98	199	37	62	38	35	(73)	13	(27)	48
	1998/99	235	51	72	28	23	(70)	10	(30)	33

^a Previous hunt number in parentheses.^b Includes permittees who did not report.

Table 7 Unit 13D mountain goat harvest data by permit hunt, 1994–98

Area	Regulatory Year	Permits issued	Percent did not hunt ^a	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Females (%)	Total harvest
DG718	1994/95	10	30	100	0	0 (0)	0 (0)	0
Unit 13D	1995/96	10	50	40	60	1 (33)	2 (67)	3
West	1996/97	10	50	60	40	2 (100)	0 (0)	2
	1997/98	10	20	75	25	1 (50)	1 (50)	2
	1998/99	10	70	67	33	1 (100)	0 (0)	1
DG719	1994/95	25	52	83	17	1 (50)	1 (50)	2
Unit 13D	1995/96	25	72	43	57	3 (75)	1 (25)	4
East	1996/97	25	36	69	31	3 (60)	2 (40)	5
	1997/98	25	60	60	40	4 (100)	0 (0)	4
	1998/99	25	48	69	31	3 (75)	1 (25)	4
Totals	1994/95	35	46	90	10	1 (50)	1 (50)	2
For all	1995/96	35	66	42	58	4 (57)	3 (43)	7
Unit 13D	1996/97	35	40	67	33	5 (71)	2 (29)	7
	1997/98	35	49	67	33	5 (83)	1 (17)	6
	1998/99	35	54	69	31	4 (80)	1 (20)	5

^a Includes permittees who did not report.

Table 8 Unit 13D mountain goat hunter residency and success, 1994–98

Area	Regulatory year	Successful				Unsuccessful				Total Hunters ^a
		Local Resident	Nonlocal resident	Nonresident	Total (%) ^a	Local resident	Nonlocal resident	Nonresident	Total (%) ^a	
DG718	1994/95	0	0	0	0 (0)	1	5	0	7 (100)	7
Unit 13D	1995/96	0	1	2	3 (60)	0	2	0	2 (40)	5
West	1996/97	0	1	1	2 (40)	0	0	3	3 (60)	5
	1997/98	0	2	0	2 (25)	2	4	0	6 (75)	8
	1998/99	0	1	0	1 (33)	0	2	0	2 (60)	3
DG719	1994/95	0	1	1	2 (17)	0	10	0	10 (83)	12
Unit 13D	1995/96	2	1	1	4 (57)	0	3	0	3 (43)	7
East	1996/97	0	2	3	5 (31)	1	9	1	11 (69)	16
	1997/98	3	0	1	4 (36)	0	5	1	6 (55)	11
	1998/99	1	2	1	4 (31)	0	9	0	9 (69)	13
Totals	1994/95	0	1	1	2 (10)	1	15	0	17 (90) ^b	19
For all	1995/96	2	2	3	7 (58)	0	5	0	5 (42)	12
Unit 13D	1996/97	0	3	4	7 (33)	1	9	4	14 (67)	21
	1997/98	3	2	1	6 (33)	2	9	1	12 (67)	18
	1998/99	1	3	1	5 (31)	0	11	0	11 (69)	16

^a Includes hunters with unspecified residency.

Table 9 Unit 14 mountain goat hunter residency and success, 1994-98

Area	Regulatory year	Successful				Unsuccessful				Total Hunters ^a
		Local resident	Nonlocal resident	Nonresident	Total (%) ^a	Local resident	Nonlocal resident	Nonresident	Total (%) ^a	
RG866	1994/95	4	0	2	6 (27)	14	2	0	16 (73)	22
Unit 14A	1995/96	2	0	2	4 (21)	15	0	0	15 (79)	19
	1996/97	2	2	1	5 (28)	13	0	0	13 (72)	18
	1997/98	1	0	3	10 (36)	10	0	1	18 (64)	28
	1998/99	3	0	4	7 (19)	24	1	4	29 (81)	36
DG852	1995/96	1	0	0	1 (33)	2	0	0	2 (67)	3
Unit 14C	1996/97	1	0	0	1 (100)	0	0	0	0 (0)	1
East Eklutna	1997/98	0	0	0	0 (0)	2	1	0	3 (100)	3
	1998/99	2	0	0	2 (50)	2	0	0	2 (50)	4
DG856	1995/96	2	0	0	2 (40)	3	0	0	3 (60)	5
Unit 14C	1996/97	3	0	0	3 (60)	2	0	0	2 (40)	5
Glacier Ck.	1997/98	5	0	0	5 (100)	0	0	0	0 (0)	5
	1998/99	1	0	0	1 (20)	4	0	0	4 (80)	5
RG868	1994/95	10	0	0	10 (21)	37	0	0	37 (79)	47
Unit 14C	1995/96	7	0	0	7 (14)	44	1	0	45 (86)	52
Twentymile River	1996/97	5	1	0	6 (13)	39	1	0	40 (87)	46
	1997/98	9	0	0	9 (19)	36	1	1	38 (81)	47
	1998/99	6	1	0	7 (20)	25	1	0	28 (80)	35
RG869	1994/95	12	3	1	16 (24)	45	4	2	51 (76)	67
Unit 14C	1995/96	13	2	3	18 (30)	40	2	1	43 (70)	61
Lake George	1996/97	14	1	4	19 (40)	26	1	2	29 (60)	48
	1997/98	18	1	5	24 (57)	12	2	4	18 (43)	42
	1998/99	7	1	7	16 (44)	15	1	2	20 (56)	36

Table 9 Continued

Area	Regulatory year	Successful				Unsuccessful				Total Hunters ^a	
		Local resident	Nonlocal resident	Nonresident	Total (%) ^a	Local resident	Nonlocal resident	Nonresident	Total (%) ^a		
RG878	1994/95	0	0	0	0 (0)	0	0	0	0 (0)	0	0
Twentymile	1995/96	0	0	0	0 (0)	2	0	0	2 (100)	2	2
River	1996/97	0	0	0	0 (0)	0	1	0	1 (100)	1	1
(archery)	1997/98	0	0	0	0 (0)	0	0	0	0 (0)	0	0
	1998/99	0	0	0	0 (0)	0	0	0	0 (0)	0	0
RG879	1994/95	0	0	0	0 (0)	0	0	0	0 (0)	0	0
Lake	1995/96	0	0	0	0 (0)	0	0	0	0 (0)	0	0
George	1996/97	0	0	0	0 (0)	1	0	0	1 (100)	1	1
(archery)	1997/98	0	0	0	0 (0)	0	0	0	0 (0)	0	0
	1998/99	0	0	0	0 (0)	0	0	0	0 (0)	0	0
Totals	1994/95	22	3	1	26 (23)	82	4	2	88 (77)	114	114
for all	1995/96	23	2	3	28 (23)	91	3	1	95 (77)	123	123
Unit 14C	1996/97	23	2	4	29 (28)	68	3	2	73 (72)	102	102
	1997/98	32	1	5	38 (39)	50	4	5	59 (61)	97	97
	1998/99	16	2	7	26 (32)	46	2	2	54 (68)	80	80
Totals	1994/95	26	3	3	32 (24)	96	6	2	104 (76)	136	136
for all	1995/96	25	2	5	32 (23)	106	3	1	110 (77)	142	142
Unit 14	1996/97	25	4	5	34 (28)	81	3	2	88 (72)	122	122
	1997/98	33	1	8	48 (38)	60	4	6	77 (62)	125	125
	1998/99	19	2	11	33 (28)	70	3	6	83 (72)	116	116

^a Includes hunters with unspecified residency.

Table 10 Unit 14 mountain goat harvest chronology percent by month, 1994–98

Area	Regulatory year	Harvest period					Unknown (<i>n</i>)	<i>n</i>
		August	September	October	November	December		
Unit 14A	1994/95	0	50	50	0	0	0	6
	1995/96	0	80	20	0	0	0	5
	1996/97	0	100	0	0	0	1	5
	1997/98	0	56	44	0	0	1	10
	1998/99	0	57	43	0	0	0	7
Unit 14C	1994/95	0	56	44	0	0	1	26
	1995/96	0	56	44	0	0	0	27
	1996/97	0	70	30	0	0	2	29
	1997/98	0	44	57	0	0	1	38
	1998/99	0	6	40	0	0	1	26
Totals for all Unit 14	1994/95	0	55	45	0	0	1	32
	1995/96	0	59	41	0	0	0	32
	1996/97	0	74	26	0	0	3	34
	1997/98	0	46	54	0	0	2	48
	1998/99	0	59	41	0	0	1	33

Table 11 Unit 13D successful mountain goat hunter transport methods, 1994–98

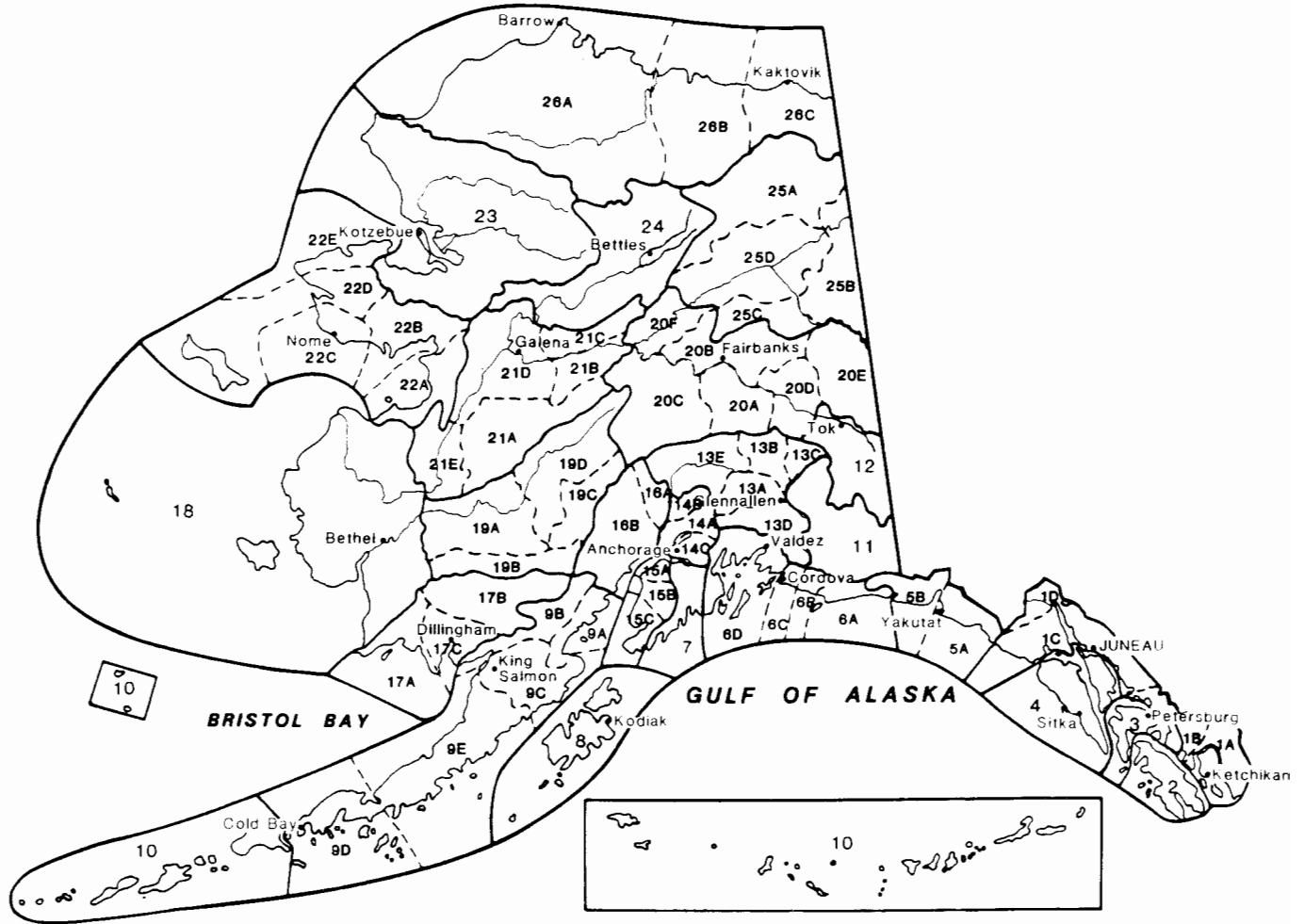
Regulatory year	Percent of harvest						Highway vehicle	<i>n</i>
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV		
1994/95	50	0	0	0	0	0	50	2
1995/96	71	0	0	14	0	0	14	7
1996/97	71	0	0	0	0	0	29	7
1997/98	17	17	33	0	0	0	33	6
1998/99	40	0	0	0	0	0	60	5

Table 12 Unit 14 successful mountain goat hunter transport methods (registration hunts only), 1994–98

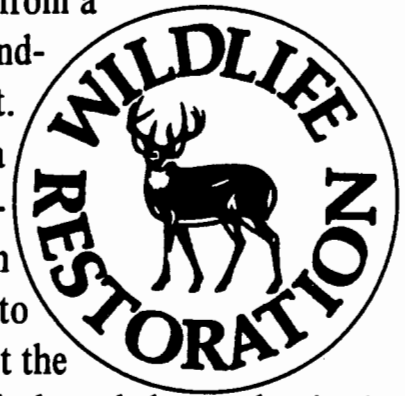
Area ^a	Regulatory Year	Percent of harvest								n
		Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Unknown	
154	RG866	1994/95	100	0	0	0	0	0	0	6
	Unit 14A	1995/96	100	0	0	0	0	0	0	4
		1996/97	80	0	0	0	0	0	20	5
		1997/98	90	0	0	10	0	0	0	10
		1998/99	71	0	14	14	0	0	0	7
	RG868	1994/95	20	0	50	0	0	20	10	10
	Unit 14C Twentymile River	1995/96	29	0	29	0	0	42	0	7
		1996/97	33	0	0	0	0	67	0	6
		1997/98	44	0	44	0	0	0	11	9
		1998/99	14	0	43	0	0	29	14	7
	RG869	1994/95	88	0	0	0	0	6	6	16
	Unit 14C Lake George	1995/96	94	0	0	0	0	0	6	18
		1996/97	95	0	0	0	0	5	0	19
		1997/98	96	0	0	0	0	0	4	24
		1998/99	100	0	0	0	0	0	0	16
Unit 14C	Totals for all	1994/95	62	0	19	0	0	12	8	26
		1995/96	80	0	7	0	0	10	3	29
		1996/97	80	0	0	0	0	17	3	30
		1997/98	82	12	0	0	0	0	6	33
		1998/99	74	13	0	0	0	9	4	23
Unit 14	Totals for all	1994/95	69	0	16	0	0	9	6	32
		1995/96	77	0	6	3	0	11	3	36
		1996/97	78	0	0	0	0	19	3	37
		1997/98	84	0	9	2	0	0	5	43
		1998/99	73	0	13	3	0	7	3	30

^a Archery-only registration hunts 878 and 879 (Twentymile River and Lake George, formerly 881 and 882) had no successful hunters.

Alaska's Game Management Units



The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sales of handguns, sporting rifles, shotguns, ammunition, and archery equipment. The Federal Aid program allots funds back to states through a formula based on each state's geographic area and number of paid hunting license holders. Alaska receives a maximum 5% of revenues collected each year. The Alaska Department of Fish and Game uses federal aid funds to help restore, conserve, and manage wild birds and mammals to benefit the public. These funds are also used to educate hunters to develop the skills, knowledge, and attitudes for responsible hunting. Seventy-five percent of the funds for this report are from Federal Aid.



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